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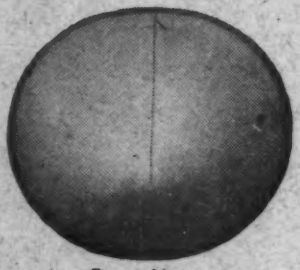

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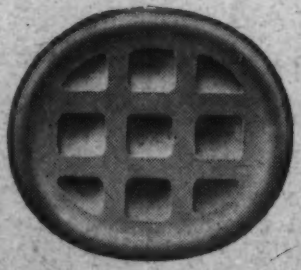

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LONDON SATURDAY OCTOBER 31 1953

THE PLACE OF FORCEPS IN PRESENT-DAY OBSTETRICS*

BY

T. N. A. JEFFCOATE, M.D., F.R.C.S.Ed., F.R.C.O.G.

(From the Department of Obstetrics and Gynaecology, University of Liverpool)

The Former Place of Forceps

The invention of the forceps was probably the most important event in the history of obstetrics, for dissemination of knowledge of the instrument, coinciding as it did with the first serious incursions of the medical profession into the realms of midwifery, gave the supremacy to the man midwife and afforded him, for the first time, opportunities for the study of normal as well as abnormal labour—a study from which all modern knowledge has come. So great an advantage did this instrument give the obstetrician of two centuries ago that it became hated by the midwives, who did everything possible to discredit it in the eyes of parturient women. It was this attitude which prompted Smellie and others of his day to use wooden- or leather-covered forceps, which, being devoid of a tell-tale metallic rattle, could be applied surreptitiously without the knowledge of either patient or handywoman.

The early patterns of forceps were short and straight, so they can have been used only when the foetal head was low in the pelvis. This, together with the fact that anaesthesia was not available, must have given them a high degree of safety and freedom from certain, although not all, misuses. It might therefore now be argued that it was unfortunate that the early instruments were very soon lengthened, curved, and supplied with axis-traction mechanisms, because it was these modifications which not only allowed but encouraged the accoucheur to reach higher and higher for the foetal head. It should be noted, however, that Smellie lengthened and curved his forceps primarily for use on the aftercoming head, and he always preferred the short straight instrument when the head presented, insisting that the presenting part must be low before they could safely be applied (see Johnstone, 1952). Responsible obstetricians of the past always recognized and taught that forceps are useless for overcoming major degrees of disproportion, but inexperienced and less skilful practitioners repeatedly tried them when the pelvic brim or cavity was contracted—with disastrous results. The objection to forceps, based initially on prejudice and vested interests, thus quickly became justified by their abuse.

With more general observance of the rules governing the safe use of forceps, the instrument gradually became more popular, but even to-day it has not completely lived down its evil reputation. It achieved a clearly defined place in obstetric practice during the latter half of the nineteenth century, and this place remained relatively static until about 25 years ago. At that time, when many of us were undergraduates, the high-forceps operation was banned even if it had not completely disappeared from the practice of the unscrupulous and less learned. Mid-forceps and low-forceps operations were regarded as proper in both domiciliary and hospital midwifery, but only as a last resort, conservatism in their use being justified by the risk of sepsis if by nothing more.

Recent Developments in Obstetric Practice and Results

The last 25 years has seen a revolution in obstetrical methods and outlook, a revolution which has, or should have, modified our views on the place of forceps as on other matters. The main factors in the revolution are well known : the introduction of the lower-segment type of caesarean section which made abdominal delivery safe even when carried out late in labour ; the discovery of sulphonamides and later of antibiotics ; the provision of facilities for immediate and adequate blood transfusion ; developments in anaesthesia ; the extension of antenatal supervision to cover practically all pregnant women ; the increased facilities for hospital delivery ; and the upgrading of maternity hospitals and of their staffs. These and other changes have brought about a dramatic fall in the mortality and morbidity rates not only of the mother but also of the child. Indeed, in some respects modern trends are better shown by foetal than by maternal results.

The fall in the stillbirth and neonatal death rates is here illustrated by the experience of the Liverpool Maternity Hospital for the 25 years 1926–50, an experience which covers the birth of 50,622 babies (Fig. 1). During this period the neonatal death rate was reduced by one-third, and the stillbirth rate by two-thirds. Moreover, there was an important change in the relative importance of the various causes of foetal death (Fig. 2). Birth injury, which has long been credited with approximately 33% of deaths, now accounts for less than 10% of stillbirths and neonatal deaths. Intranatal and neonatal asphyxia still take a heavy toll, mainly because of associated prematurity. Foetal malformation becomes relatively more important as preventable causes disappear.

*Read in opening a discussion in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Cardiff, 1953.

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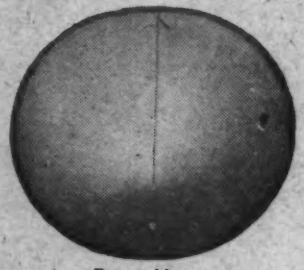
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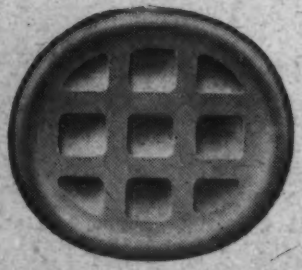
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All manner of factors have played a part in this reduction in foetal mortality, and it is impossible to apportion the credit exactly, but study of the results suggests that it is mainly due to better intranatal care of the foetus. This in turn is the result of the appointment of *resident* obstetricians of greater skill and experience and, along with this, a change in obstetric management. In obstetrics, as in politics, the last quarter-century has seen a swing from the conservative to the radical outlook. There has been more and more interference with natural delivery, no matter whether the foetus presents by the head or by the breech. Thus the forceps delivery rate has risen from 6–7% to 16–17% of total births (Fig. 3), an increase which has occurred at the expense of spontaneous delivery and not of caesarean section. Indeed, during the 25 years the section rate also rose from 5 to 15% (Fig. 3). Altogether, in a hospital which deals with highly selected material and includes a high proportion of abnormal cases, approximately one-third of the babies are now delivered either by forceps or by caesarean section.

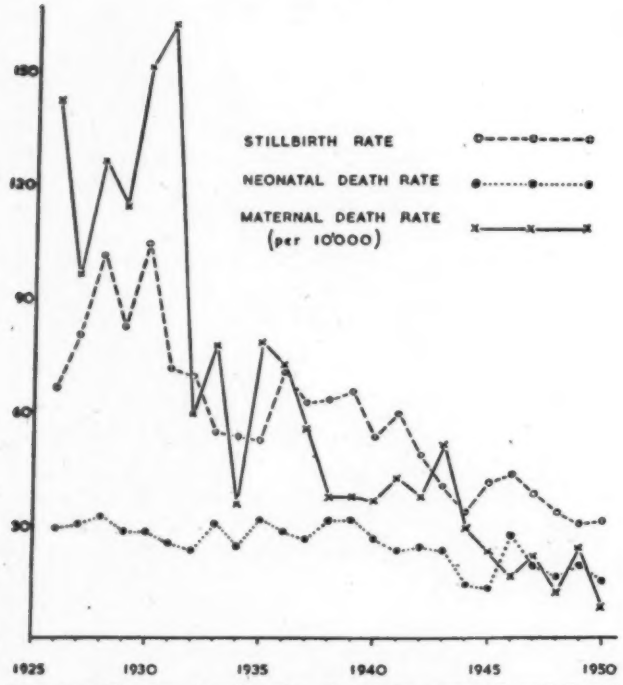

FIG. 1.—Diagram showing the change in maternal and foetal results at the Liverpool Maternity Hospital during 25 years.

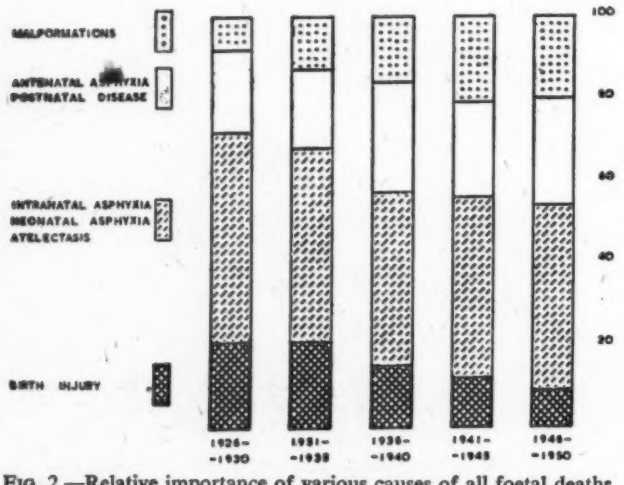

FIG. 2.—Relative importance of various causes of all foetal deaths for five-year periods during 25 years, shown in percentages. "Intranatal and neonatal asphyxia and atelectasis" includes deaths associated with prematurity except where there was definite evidence of intracranial injury. "Antenatal asphyxia" includes all deaths *in utero* before the onset of labour.

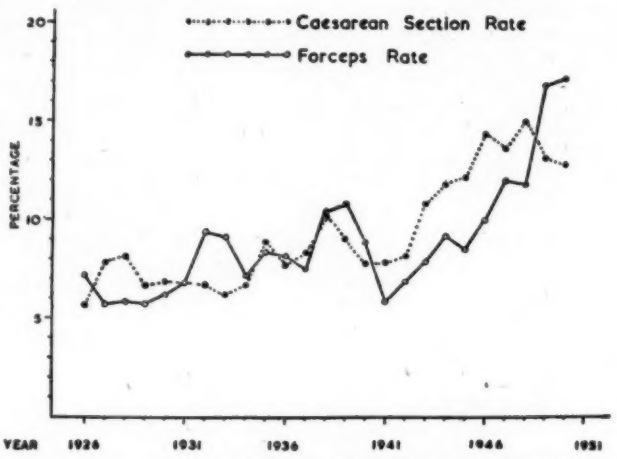

FIG. 3.—Rates for caesarean section and forceps delivery expressed as percentages of all births in the Liverpool Maternity Hospital during 25 years.

FIG. 4.—Diagram showing the falling foetal mortality associated with forceps delivery. Foetal mortality in this and other tables includes both stillbirths and neonatal deaths.

Decreased Risks of Forceps Extraction

Not only have the forceps operations increased in number, they have at the same time decreased in risk. Thus the foetal mortality attending the operation has fallen from 20 to 2% (Fig. 4). At the same time the danger to the mother has become very small. During the last 15 years of the period under review 3,522 women were delivered with forceps and 13 died. The fatal outcome was unrelated to the operation in at least seven of these; in the remaining six anaesthesia was the cause of death of three women and contributed to the death of a fourth. There was only one case, in 1941, in which the operation was the direct cause of death. In this, severe shock developed after a difficult mid-forceps delivery.

The risks of forceps have been reduced by changing their method of use and their indications.

Changes in Technique

Under this heading many matters might be mentioned: the discarding of all forms of axis-traction instrument; the substitution of skill for force in traction; the use of episiotomy; the correction of the position of the foetal head

before or after the application of the forceps, and, more recently, the use of local analgesia. The most important of all changes in technique, however, has been the ever-increasing emphasis placed on the accurate application of the blades to the sides of the foetal skull.

Changes in Indications

The decision on when forceps can safely be used is probably more important than knowing how to use them, and a modification in outlook regarding the time and place for forceps is a striking feature of the obstetrical revolution of the last 25 years, and the main reason for the improvement in results. This modification in outlook is not unrelated to other developments. The increased safety of caesarean section has, for example, done away with the need to use forceps in cases mechanically obstructed late in labour. Whereas formerly only the high-forceps operation was condemned, it has gradually but convincingly been demonstrated that many mid-forceps operations, even though technically possible, are prejudicial to the health

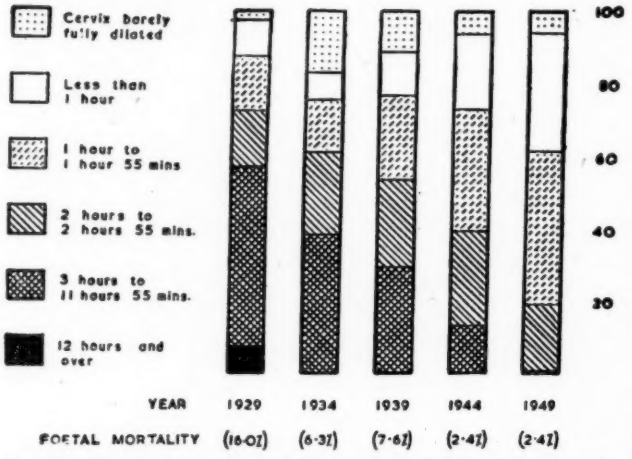

FIG. 5.—Duration of the second stage of labour in cases of forceps delivery, expressed in percentages. 1929 is the first year for which details are available. "Cervix barely fully dilated" refers to those cases in which the anterior lip was not fully taken up or in which cervicotomy was carried out.

and life of both mother and child. Difficult mid-forceps operations have therefore become fewer and fewer, the safer alternative of caesarean section being preferred. On the other hand, the number of forceps deliveries has become swollen at the expense of what would have been spontaneous deliveries had the second stage been allowed to continue longer. The situation might be summarized by saying that babies previously born dead with forceps are now being delivered alive by caesarean section, while those stillborn as a result of spontaneous delivery are now extracted alive with forceps.

Formerly, in accordance with conservative principles, the second stage of labour was allowed to continue almost indefinitely provided foetal distress did not develop. This usually meant that when it was finally decided to use instruments not only was the mother exhausted but the foetus was asphyxiated and already suffering from cerebral congestion if not more serious damage. A baby in poor condition was then subjected to anaesthesia and to the trauma involved in rotation and extraction, with considerable risk of a fatal outcome.

The ever-improving results are associated not only with more frequent use of forceps but with their more timely use. The trend towards a shorter duration of the second stage prior to forceps delivery is shown in Fig. 5.

Indications for Forceps Delivery in Modern Practice

Nearly every student taking the final examination, if asked the indications for forceps, gives priority to "maternal distress" and "foetal distress." It is the traditional answer, but is it still acceptable? If by maternal distress is meant physical exhaustion manifested by a rising pulse rate, prostration, ketosis, and possibly pyrexia, then it should no longer be accepted as an indication for forceps. It is indefensible to allow any woman in the second stage of labour to reach such a state, and forceps extraction (if it is the appropriate treatment) should have been carried out much earlier. Similarly with foetal distress. This condition may come on suddenly and without much warning, in which case immediate forceps delivery is called for, provided the usual conditions are satisfied. In most cases, however, prolongation of labour and slow advance give ample warning that foetal asphyxia is likely to develop. In all such cases the distress should be anticipated and forceps applied while the foetus is in relatively good condition. Good obstetrics calls for intelligent anticipation, and if it is clear that the presenting part is held up on the perineum it is unjustifiable to withhold assistance because an arbitrary time limit has not expired or because the foetal heart is steady. Similarly, if the mother and baby have been exposed to a long and tiresome first stage of labour it can be assumed that neither is well fitted for the ordeal of the second stage, and that they will show evidence of stress sooner or later.

One condition which deserves special mention is uterine inertia in the second stage of labour. There are still some who, fearful of poor uterine action in the third stage, recommend deferring delivery. This outlook again is a relic of the past and takes no account of modern efficient methods for preventing and controlling post-partum haemorrhage. With care over anaesthesia and with ergometrine at hand, forceps extraction is nearly always the best treatment of inefficient uterine action once the cervix is fully dilated.

A low-forceps delivery before evidence of foetal distress or before an absolute indication is present is often called a "prophylactic forceps" operation—a term introduced by De Lee in 1920. It was some time before it was accepted in this country, and it has caused derision amongst older obstetricians, who regard it as an excuse for meddlesome midwifery. I am not concerned to defend the term, although it is expressive in that it indicates that the operation is preventive—preventive of foetal asphyxia and death, preventive of maternal injury and nervous stress. I am concerned, however, to justify the use of forceps as a leisurely planned operation *before* the onset of a situation which results in their use becoming dangerous. Even if the prophylactic forceps operation is sometimes an unnecessary operation, no harm comes of it in skilful hands.

It is necessary to recognize, however, that the freedom with which forceps can safely be used must vary with the circumstances under which midwifery is carried out. The decision in each individual case must always rest on whether the application of forceps is safer for mother and child, bearing in mind the skill of the obstetrician, the availability of assistants, and the facilities and equipment of his environment. The indications are therefore different in domiciliary and hospital practice.

Domiciliary Practice

Outside hospital it is probably wisest and safest for no one, no matter how expert, to attempt any forceps delivery unless the vertex is below the level of the ischial spines and is visible at the vulva. Even then it is necessary to ensure that the head is really as low as it appears and that the signs are not deceptive because of shallowness of the pelvis and extreme moulding and caput formation. No part of the head should be palpable abdominally. If high standards of asepsis cannot be maintained, and if an anaesthetist is not available, it is usually best to leave it to Nature as long as is reasonably possible and until a clear indication for delivery is present. There is only a limited place for a "prophylactic" operation in domiciliary practice.

Hospital Practice

Granted a fully equipped and expertly staffed hospital, a low-forceps operation combined with episiotomy can usually be carried out with impunity, and therefore with freedom. It involves less risk for both mother and child than does a spontaneous delivery after a protracted second stage of labour. No matter whether the occiput be anterior or posterior, it does not require rotation at this level in the pelvis. Care has to be taken to exclude such possibilities as contraction of the bony outlet, but this is a bogy which has been grossly exaggerated. Outlet contraction sufficient to cause real difficulty is exceptionally rare in a pelvis where inlet *and cavity* are adequate.

Even in hospital, however, a mid-forceps delivery must be approached with caution, recognizing that it almost always involves dealing with an unrotated head. This does not mean that the head is malrotated; it is normal for the sagittal suture to remain transverse or oblique until the vertex reaches a low level. Other speakers are dealing with the problem of the unrotated head, and I would stress the second difficulty associated with the mid-forceps operation —namely, the presence of previously unrecognized disproportion at the level of the mid-plane of the pelvis. Although in most cases the experienced obstetrician can sift the cases accurately and decide beforehand which will deliver easily with forceps and which will not, there is always the possibility of meeting unexpected difficulty, and particularly so in a multigravida with an unusually large baby. The likelihood of an error in judgment is reduced by intranatal radiography, facilities for which should be available in all maternity units.

It is in the case in which forceps have been applied, and in which unexpected difficulty is encountered, that tragedy may occur. The tragedy results from a train of human reactions which have personal pride and prestige as their basis. We have all experienced them. The unexpected resistance to delivery is followed by a stronger pull and then removal of the blades to confirm the position of the foetal head. Further traction with little effect brings to mind the vision of a stillbirth. Now is the time to stop, but the patient and her relatives have been prepared for forceps delivery, not caesarean section. Moreover, it requires much courage to admit to assistants, midwives, and onlookers that a mistake has been made and that vaginal delivery is not safe. The remote possibility of successful delivery spurs the obstetrician to renewed and more frantic efforts. Now he is seized with dread, casts caution to the winds, and ultimately he may or may not succeed in extracting a mangled foetus, the mother also being injured in one way or another.

The situation is more dangerous if some progress is made than if the passage of the foetal head is completely obstructed. In the former case the foetal head is crowded more and more into an ever-decreasing pelvic diameter, with inevitable injury; in the latter it can come to no harm except from the pressure of the forceps themselves.

One of the fears which drive the obstetrician to make frantic efforts is that the case may become one of "failed forceps"—a label which by tradition involves everyone concerned with ignominy, and which itself can be responsible for bad obstetrics. How much better it would be if it were generally recognized that even the best exponents can make a mistake occasionally, and that failure to deliver with forceps is not so great a sin as a failure to recognize defeat at an early stage. If the forceps are applied skilfully no harm comes to the baby or to the mother, provided the attempts at extraction are discontinued immediately it becomes clear that there is greater difficulty than anticipated. All that is necessary is to have the courage to proceed to caesarean section before the life of the foetus is jeopardized.

Trial of Forceps

This raises the question of whether, under proper conditions, a "trial of forceps" is an acceptable procedure. This means that when the head is arrested in the mid-pelvis forceps should be applied tentatively with the declared intent of abandoning the operation in favour of caesarean section if it does not proceed smoothly. The forceps need to be applied accurately to the foetal head, and traction has to be cautious. If all mid-forceps deliveries in hospital were viewed as trial operations the dread of failure would disappear from the mind of the operator and he would be happy not to proceed in the face of difficulty. The idea of a trial of forceps is not new. It was suggested and practised by Frank (1908) and again by Fraenkel (1925) and others in the 1920s. It has been recently advocated by Parry Jones (1952) and by Douglass and Kaltreider (1953).

When it was first introduced it was difficult to justify because of the maternal risk of caesarean section after interference *per vaginam*. Now, however, that this risk has largely gone, it should be re-examined and not discarded merely on the grounds of prejudice. It could, of course, be abused, and it has no place save in the hands of the expert working in hospital—the same qualifications which apply to the accepted practice of trial of labour. The only difference is that trial of labour is concerned with disproportion at the brim; trial of forceps is concerned with disproportion in the cavity. The trial of forceps may have only a small place, but if it has a recognized place it may well help to do away with the tragic condition of "failed forceps" and it may revolutionize the outlook of everyone concerned in any forceps delivery. As Douglass and Kaltreider (1953) point out, "It is a most comforting thought, when sitting down to do a mid-forceps operation, that one is not irrevocably committed to vaginal delivery."

Do Forceps Protect the Baby?

It has often been argued in recent years that the blades of the forceps, if properly and accurately applied, protect the foetal head from injury. The argument is not illogical, and its truth is already established in the special case of the after-coming head. The frequent and almost regular use of forceps for lifting the after-coming head from the cavity of the pelvis is one of the most important factors responsible for the low foetal mortality for breech delivery in the Liverpool Maternity Hospital (Cox, 1950).

Forceps are also said to protect the fore-coming head, especially the small and soft head of the premature baby (Studdiford and Salter, 1938; Scott, 1940; Assali and Zacharias, 1947). This matter still awaits proof, but in our experience forceps certainly do no harm and may do good so far as the delivery of small babies of toxaemic mothers is concerned (Hamilton, Jeffcoate, and Lister, 1949).

Advantages to the Mother

So far, the use of forceps has been considered almost entirely from the standpoint of the foetus. If under modern conditions this instrument must be regarded more and more as being primarily used in the interests of the child, it should also be recognized that Smellie, too, viewed it in this light and adopted it with the idea of reducing his stillbirth rate. It offers a means for speeding delivery to give the baby opportunity to establish its own respiratory function before the respiratory function of the placenta fails. Nevertheless, the question arises whether forceps bring any advantage to the mother. If properly used after full dilatation of the cervix, and in conjunction with episiotomy, and assuming asepsis, they should have no ill-effect. They are sometimes blamed for fistulae and other injuries, but these are mostly due to the condition calling for the use of forceps. They are clearly of advantage in that they shorten labour and spare the woman much mental and physical stress.

Do they prevent prolapse? There is some evidence to show that a prolonged second stage with overstretching and devitalization of the paravaginal tissues is more important

in causing prolapse than a quicker delivery with a tear or episiotomy. The matter is still *sub judice*, but meanwhile there is nothing to suggest that forceps in the hands of the expert do any harm to the mother, and they may be instruments of good as well as of mercy.

Dangers of Forceps in Modern Practice

The greatest danger of forceps delivery at the present time is anaesthesia, and this danger has, if anything, increased with the introduction of modern anaesthetic agents whose safety depends on increasing skill on the part of the anaesthetist. As mentioned previously, there have been six maternal deaths associated with forceps delivery in the Liverpool Maternity Hospital during the 15 years preceding 1950. Three of these were the result of the inhalation of vomit during induction of general anaesthesia, and the fourth was due to the effect of an anaesthetic on a diseased heart. Since 1950 there have been more cases of inhalation asphyxia and pneumonia as a result of vomiting during induction or recovery from anaesthesia given for the purpose of the application of forceps. This risk is very great when labour has been prolonged, as it has in many cases in which forceps delivery is indicated. The other risk is third-stage and post-partum haemorrhage associated with depression of myometrial activity by the anaesthetic.

To recognize these risks, and to have them ever present in mind, is to reduce them to a minimum. They constitute the chief reasons for advocating the use of local analgesia for all easy low-forceps extractions.

Conclusion

There is danger in praising forceps too highly and in claiming too large a place for them; it might encourage their abuse. There is also danger in adopting an ostrich-like attitude and failing to recognize that times have changed, and are changing. It will not do to condemn forceps merely on the grounds that they represent interference with Nature, if it can be shown that their results improve on those achieved by Nature.

The fact that childbirth is a physiological process does not necessarily mean that it is a benign one. The reproductive function in all species is both dangerous and wasteful. Nature is not concerned with making reproduction safe for individual mothers or offspring; she expects losses, and for this reason provides a supply of potential offspring which is so bounteous as to offset them and ensure the continuance of the race.

The natural maternal and foetal mortality rates are unknown, but it is quite certain that they are much higher than those which obtain when the medical and nursing professions stand by ready to interfere judiciously with Nature. Obstetricians do well to leave childbirth to Nature only so long as she is efficient, but when she fails—as she often does—lives can be saved only by carefully planned and skilful intervention. Moreover, as the means and methods for intervention become safer, they can offer more and more to the individual than can Nature.

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"FAILED FORCEPS": A REVIEW OF 37 CASES

BY

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During the period January 1, 1948, to May 31, 1952, 37 cases of "failed forceps deliveries" were admitted to the Norfolk and Norwich Hospital. Of these patients 21 were primigravidae and 16 multiparae. This paper is based upon an analysis of these cases.

Maternal and Foetal Hazards

A study of the recent annual reports of nine hospitals shows the maternal mortality rate in "failed forceps" cases to be 2.0%, while the foetal loss is 36.2%. So far as the risk to the foetus is concerned these findings are in reasonable conformity with those in the present series as shown in Table I. It will be seen that seven infants were

TABLE I.—*General Analysis of the Present Series*

	No. of Cases	Maternal Morbidity	Foetus Dead on Admission	Still-births	Neonatal Deaths	Total Foetal Loss
Primiparae	21	6 (28·6%)	2	3	1	4 (19·1%)
Multiparae	16	4 (25·0%)	4	4	1	5 (31·2%)
Total ..	37	10 (27·0%)	6	7	2	9 (24·3%)

stillborn, while a further two died during the neonatal period, the total foetal loss being 24.3%, or 22.2% if correction is made for one case of hydrocephalus.

Although no mother died as a result of this intervention, the maternal morbidity rate stood at the high figure of 27.0%. The remote prognosis for these patients may thus be less favourable than the immediate results suggest, since, as emphasized by Miller (1928), Claye (1931), Stacey (1931), and Feeney (1947), the sequelae of puerperal infection often persist for many years.

Duration of Labour

Table II shows that labour tended to be prolonged in these cases compared with normal vertex deliveries, this being most marked in primigravidae. In these patients the

TABLE II.—*Duration of Labour in Failed Forceps Deliveries*

		Total Cases	First Stage Over 24 Hours	Second Stage Over 2 Hours
Primiparae	Failed forceps* ..	19	12 (63·2%)	14 (73·7%)
	Normal	185	36 (19·5%)	19 (10·3%)
Multiparae	Failed forceps* ..	11	2 (18·2%)	7 (63·6%)
	Normal	215	22 (10·2%)	1 (0·5%)

* Excluding 6 caesarean sections and 1 case in which details were absent.

first stage lasted over 24 hours in 63.2% of cases, a finding that suggests that, in some cases at least, delivery may have been attempted for this reason alone. The second stage lasted more than two hours in 73.7% of primigravidae, and 63.6% of multiparae. This, however, was mainly due to the time expended in transferring the patient to hospital.

Past Obstetric History in Multiparae

The past obstetric history in the 16 multiparae is summarized in Table III. It will be seen that a history of previous dystocia was given by eight patients (50%), while of eleven cases in which details regarding the size of

Table III.—*Analysis of Past Obstetric History in Multiparae*

Case No.	Parity	Past History	Maximum Past Weight	Present Weight
				lb. oz.
4	6	Normal	8 lb.	9 0
6	1	Stillbirth. Cause unknown	6½ ,,	7 14
8	7	2 forceps deliveries	Unknown	7 8
11	4	Normal	,,	10 3
15	8	Forceps with last	7½ lb.	6 8
16	1	,, delivery	7½ ,,	8 1
17	9	Normal	Unknown	7 13
19	1	Forceps. Occipito-posterior	7½ lb.	7 8
20	1	Normal	Unknown	7 8
22	4	,,	6½ lb.	6 4
25	4	,,	9 ,,	10 12
27	1	Forceps delivery	8½ ,,	10 4
28	2	Both forceps. First stillborn	10 lb. (S.B.)	10 10
30	1	Normal	8½ ,,	10 5
33	2	First forceps. Stillborn	Unknown	9 11
37	3	Normal	11 lb.	9 8

former infants were available, in no fewer than seven the present infant was larger than its forerunners and was thus capable of causing difficulties not previously experienced.

Causes of Failure

As pointed out by previous writers on this subject (Phillips, 1926; Murray, 1927; Miller, 1928; Claye, 1931; Stacey, 1931; Feeney, 1947; Browne, 1949; Freeth, 1950), the three fundamental factors responsible for failure to deliver the patient are disproportion, incomplete cervical dilatation, and some malposition of the foetal head. That two or more of these factors may be present in one and the same case is shown in Table IV, where, for the sake of clarity, the main cause is emphasized.

Table IV.—*Causes of Failure to Deliver the Patient*

	No. of Cases	Cause Present			Type of Cause		
		Single	Multiple	None	Disproportion	Undilated Cervix	Malposition of Head
Primiparae	21	14	3	4	3	3 (2)	11 (2)
Multiparae	16	7	7	2	4	3 (5)	7 (4)
Total	37	21	10	6	7	6 (7)	18 (6)

The numbers in parentheses indicate subsidiary conditions.

In 18 cases some malposition of the foetal head—usually an occipito-transverse or occipito-posterior position—was the main reason for failure. In addition this feature was observed in a further six patients, although here it was not the main cause. Thus, in 64.9% of cases the foetal head was not in a suitable position for a straightforward forceps delivery. By contrast, disproportion was present in only seven cases—three primigravidae and four multiparae—an incidence of 18.9%. Incomplete cervical dilatation occupied a position mid-way between the two conditions already mentioned, being encountered as a main factor in six cases and as a subsidiary in a further seven, the total incidence being 35.1%.

It is interesting to note that these results compare closely with those observed in the much larger series reported by Freeth (1950), with the difference that malposition of the head was often observed in multiparae. This finding is also contrary to the views of Claye (1931), who was of the opinion that anterior rotation of the occiput almost invariably took place in these patients.

Method of Delivery in Hospital

This aspect of failed forceps deliveries, which was fully described by Freeth (1950), is summarized in Table V. Craniotomy was necessary in two cases only (5.4%). In one the foetus was hydrocephalic, while in the other, in which disproportion was present, the foetal heart sounds disappeared shortly after admission. This low incidence of destructive operations—Stacey (1931) gave the proportion of cases thus delivered as 25%—together with the fact that caesarean section was carried out in six cases (16.2%), supports the prevailing view that the indications for section in cases of this nature could well be broadened.

Of the remaining 29 cases, 6 (16.2%) delivered themselves spontaneously after time had been allowed for full cervical dilatation to occur. A forceps delivery was necessary in 23 patients (62.2%). In this latter group seven of the deliveries were classed as "easy low forceps," the presenting part being on the pelvic floor and the occiput anterior. Thus in a total of 13 cases (35.1%) delivery ultimately presented no special problem, the original difficulty encountered in the attempted extraction having disappeared.

Table V.—*Methods of Delivery in Hospital*

	Spontaneous	Forceps				Caes. Section	Caes. Hyst.	Craniotomy
		Low	And Rotation	As O P.	Total			
Primiparae	3	5	8	2	15	2	—	1
Multiparae	3	2	6	—	8	3	1	1
Total	6	7	14	2	23	5	1	2

Discussion

Taking into account the three main causes of failed forceps deliveries, it is evident that the incidence of these cases could best be reduced by timely recognition of disproportion, incomplete cervical dilatation, and malpositions of the foetal head.

Disproportion.—In most cases this abnormality can be recognized during the antenatal period. Although even in a primigravida the fact that the foetal head fails to engage at or near term is not necessarily indicative of disproportion, this must always be excluded. In every such case, therefore, clinical pelvimetry, supported if necessary by radiological assessment of the pelvis, should be carried out. This policy is the one generally followed in primigravidae. In multiparae the possibility of disproportion is often overlooked. To a large extent this is due to the belief that in these patients engagement of the foetal head before the onset of labour is the exception rather than the rule. Whatever the truth of this view, the fact remains that in some of these patients disproportion is present. This is shown in Tables III and IV, which suggest that stricter antenatal assessment is necessary in multiparae, especially with regard to the relationship between the size of the present infant and that of its predecessor. Recognition of disproportion after the onset of labour, although even more vital, is often more difficult. It is usually agreed that once the lowest bony part of the head has descended to the level of the ischial spines engagement has taken place. Although this is true in most cases, such a finding may be misleading either if excessive moulding has occurred or if the pelvis is abnormally shallow. At other times the presence of a large caput obscures the actual bony level of the foetal head. For these reasons it is safer to determine whether or not any portion of the head can be palpated above the symphysis pubis, it being taken that should any be felt delivery will be dangerous (Browne, 1949).

Incomplete Cervical Dilatation.—Although in theory full cervical dilatation can be present when a rim of cervix is still palpable, in practice this is rarely the case. It is therefore safest to assume that so long as any portion of the cervix can be felt on vaginal examination full cervical dilatation has not yet been reached. To attempt a forceps delivery under such conditions would be unwise. This rule should apply as rigidly to multiparae as to primigravidae. Although in the former patients the cervix is often reputed to be soft and easily dilatable this is not always so, the residual rim of cervix on occasion proving an effective bar to delivery. At other times delivery may only succeed at the expense of a dangerous cervical laceration. If indications to terminate labour arise before full dilatation,

incision or manual stretching of the cervix has been recommended (Browne, 1949). These procedures, however, have a limited application and are fraught with hazard. In such cases, therefore, it is probably wiser to transfer the patient to hospital.

Malpositions of the Foetal Head.—Since, as has been pointed out by Freeth (1950), it is unwise to assume that the occiput is necessarily anterior, it is essential to determine the position of the foetal head before applying the forceps. For this it is usually recommended that an ear be sought or, failing this, that the nape of the neck be identified (Browne, 1949). These measures, although possessing a high degree of accuracy, have the disadvantage that full anaesthesia is necessary for their proper application. This objection no longer obtains if use is made of the suture lines to determine the position of the occiput. These landmarks can easily be reached in most patients, and with practice a high degree of accuracy in their identification may be obtained. Late in labour caput formation may obscure these features to some extent, though in all but exceptional cases they can usually be made out with time and patience. If doubt still exists a good case can be made for examination under anaesthesia, the whole hand being passed into the vagina. Such a measure should, however, in no way commit the obstetrician to immediate delivery if the position of the head or the state of the cervix implies that this course would be unsafe.

Conclusions and Summary

An attempt has been made to determine the causes and assess the dangers, both to the mother and to the foetus, of "failed forceps deliveries."

The importance of these emergencies lies mainly in the fact that they represent a small subgroup of that category of deliveries loosely termed "difficult forceps" in which essentially the same conditions and the same dangers exist. Thus, as Fletcher Shaw (1928) pointed out, for every case in which failure occurs there must be many in which delivery is accomplished only after prolonged and dangerous traction, often through an incompletely dilated cervix.

The amount of maternal disability and foetal loss in these cases must be considerable. In consequence, every effort should be made to reduce the extent of this hazardous intervention.

Thirty-seven cases of "failed forceps deliveries" admitted to the Norfolk and Norwich Hospital are reviewed.

In over half of the multiparae consideration of the past obstetric history might have provided grounds for suspecting dystocia.

The causes of failure at the initial attempt at delivery were malpositions of the foetal head, incomplete cervical dilatation, and disproportion. This last factor, however, was not a common finding in the present series.

In a considerable proportion of cases (35.1%) delivery ultimately presented no particular problems.

Suggestions for the earlier recognition of the causes of failure have been discussed.

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SICKLE-CELL ANAEMIA IN THE ACCRA DISTRICT OF THE GOLD COAST*

A REVIEW OF TWENTY CASES

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It has been found impossible, in reviewing the literature, to assess the incidence of sickle-cell anaemia either in America or in Africa. The incidence of sickle-cell anaemia to the sickle-cell trait has been reported in America to vary from 1:2 (approximately) (Winsor and Burch, 1945) to 1:71 (Switzer and Fouché, 1948), with many intervening estimates. These figures show great disparity, but they do prove that sickle-cell anaemia is relatively common in America when it is remembered that approximately 900,000 negroes in the United States exhibit the trait (Beacham *et al.*, 1950).

On the other hand, the majority of writers in Africa regard sickle-cell anaemia as rare, in spite of the fact that the incidence of the trait in the African native may be more than double that of the American negro (Gelfand, 1944; Murray-Lyon, 1944; Beet, 1947; Robertson and Findlay, 1947; Mackey, 1949; Raper, 1950; Lehmann, 1951; Jelliffe and Humphreys, 1952; *British Medical Journal*, 1952). Smith (1943), however, estimated the incidence of the anaemia to the trait to be 1:5 in Nigeria, and Lambotte-Legrand (1951) stated that 6% of trait-positive Africans in Leopoldville suffered from sickle-cell anaemia. Foy *et al.* (1951), in Kenya, did not describe any cases, but stated that there were four cases of sickle-cell anaemia in the 13 trait-positive Africans examined, and concluded that the anaemia was commonest among infants and newborn babies. This statement, however, requires confirmation, as it has been shown that the neonate may be protected against sickle-cell anaemia (Watson, 1948; Edington, 1952), and there are only three reports in the literature of sickle-cell anaemia occurring under the age of 4 months (Cohen *et al.*, 1947; Frazier and Rice, 1950; Heldrich, 1951). Thus the part that the sickling phenomenon plays in the morbidity and mortality rates of the African native has still to be assessed.

I have diagnosed sickle-cell anaemia in 33 instances. Only one examination was possible in 13 patients, however, and these are consequently not considered in this review.

The following investigations were employed to discover those who were suffering from sickle-cell anaemia. (1) One patient was discovered on routine surveys of the population in which 2,255 Africans were examined and questioned. The findings are shown in Table I. It is not intended to discuss these surveys in detail. (2) Patients in the Gold Coast Hospital in whom a sickling test had been requested and found positive were examined. Of 60 sickling-positive patients investigated four were considered to be suffering from sickle-cell anaemia. (3) Patients in the Gold Coast Hospital showing many target cells in the peripheral blood smear on which routine differential counts were being performed

*This paper is based on part of a thesis submitted for the degree of M.D. of the University of Glasgow.

Table I.—*Incidence of the Sickle-cell Trait in 2,255 Africans, Showing Age, Sex, and Type of Group Examined*

Age Group	Type of Group	Persons Examined		Males		Females	
		No.	Sickling	No.	Sickling	No.	Sickling
Newborn	Newborn	384	71	211	44	173	27
8–12 yrs.	School-children	200	36	100	19	100	17
12–24 ,,	Boys	327	48	327	48		
16–26 ,,	Nurses	428	90	85	12	343	78
Adults ..	Anaemia	123	9			123	9
,, ..	Pregnancy	413	75			413	75
,, ..	Patients	125	21	62	11	63	10
All ages ..	Villagers	255	57	113	22	142	35
	Total	2,255	407 (18%)	898	156 (17·4%)	1,357	251 (18·4%)

were examined. Of 50 patients investigated two were considered to be suffering from sickle-cell anaemia.

The remaining 13 cases were discovered among patients referred to me by medical colleagues as suspected cases for investigation.

Diagnosis of Sickle-cell Anaemia

The diagnosis of sickle-cell anaemia in Gold Coast Africans is not an easy task, as their "normal" values in clinical medicine are unknown. Colbourne *et al.* (1950), in an attempt to discover the "normal" clinical findings, thoroughly investigated a village of 255 inhabitants in the Southern Gold Coast. The diseases from which these villagers suffered are shown in Table II.

Table II.—*Incidence of Diseases in a Village of 255 Inhabitants*

Condition	%	Condition	%
Ancylostomiasis	52	Malarial parasitaemia ..	32
Ascariasis	76	Signs of malnutrition ..	26
Enlargement of liver	33	Schistosomiasis	9
,, ,, spleen ..	46	Streptocerciasis	21
Guinea-worm infection ..	52	Yaws	75
Herniae	10	Sickle-cell trait	22

The blood counts and the haemoglobin and haematocrit values fell much below the standards regarded as normal in Britain. Malaria, liver disease, malnutrition, ancylostomiasis, and bilharzial infection are all capable of causing anaemia, and may all be found in one individual. The haematological findings in Africans suffering from anaemia may thus not be clear-cut. In one individual there may be present both a haemolytic factor (malaria) and a macrocytic factor (liver disease and malnutrition) in addition to an iron deficiency (ancylostomiasis and schistosomiasis). I thus had difficulty in deciding the criteria necessary for the diagnosis of sickle-cell anaemia. In the surveys it was decided primarily to rely mainly on the history given by the individual and to investigate thoroughly all cases in which a history of *recurrent* attacks of joint pain, vague ill-health, or jaundice was given. In addition, individuals showing more than 4% of target cells in peripheral blood smears were investigated, as Diggs and Bibb (1939) found these cells in all the 47 cases of sickle-cell anaemia they discussed. The method of discovering patients suffering from sickle-cell anaemia employed in the survey is open to criticism, but in the one girl in whom sickle-cell anaemia was diagnosed the history was dramatic and was not simulated by any of the other individuals examined and questioned. It should be noted that acute rheumatism is extremely rare in the Gold Coast.

Sickle-cell anaemia was not finally diagnosed unless the following criteria were fulfilled: (*a*) sickling of the erythrocytes; (*b*) signs of increased haemolysis in the peripheral blood with a persistently raised reticulocyte count; (*c*) lack of response of the haemolytic anaemia to antimalarial therapy; (*d*) a low erythrocyte sedimentation rate and lack of response of the joint pains to salicylate therapy; and (*e*) absence of any other condition which might be responsible for the haemolytic anaemia.

Methods Employed in the Investigation

The rapid bacterial method (Robinson, 1945) was used throughout to detect the presence of sickling. Haemoglobin was estimated by Sahli's method, using two haemoglobinometers which were afterwards kindly calibrated by Dr. J. V. Dacie at the Postgraduate Medical School, Hammersmith, and Dr. J. N. Marshall Chalmers at St. George's Hospital. The packed cell volume was estimated by centrifuging oxalated venous blood (Wintrobe's method) in a haematocrit tube at 3,000 r.p.m. for 30 minutes. Red- and white-cell counts were performed in three sets of pipettes which were checked against each other and against normal individuals (European). They consistently gave similar results, and it is not felt that grave inaccuracies have resulted. Reticulocytes were counted by the coverslip method, using an alcoholic solution of brilliant cresyl blue. Five hundred cells were counted. Target cells were enumerated on a thin blood smear stained by Leishman's method.

The 500 cells were counted by moving transversely across the centre of the smear and the percentage of target cells to the nearest whole number was calculated. Serum bilirubin was estimated by the use of a Lovibond's comparator. Coombs's test was performed, using dried anti-human-globulin serum supplied by the Ministry of Health Blood Group Reference Laboratory. The erythrocyte sedimentation rate was estimated in the manner described by Wintrobe (1947). No correction for anaemia was made. The bromsulphthalein excretion test was performed with a dosage of 2 mg. per kg. and blood was withdrawn at the end of 30 minutes. An alkalinized portion of the serum was compared with prepared known percentage standards and acidified serum. The standard three-tube Kahn test was employed. Routine blood culture, Widal, and Weil–Felix tests were performed when considered necessary. It was not possible to perform investigations requiring the use of a colorimeter. The faecal urobilinogen output or haemolytic index was not calculated. Schlesinger's test was employed to detect urinary urobilin and the resultant colour was compared with a normal standard.

Review of the Cases

Three females and 17 males, representing six Gold Coast tribes, were considered to be suffering from sickle-cell anaemia (see Table III).

Table III.—*Age and Sex Groups of 20 Cases of Sickle-cell Anaemia*

Sex	No.	Age in Years					
		0–5	6–10	11–20	21–30	31–40	Over 40
Male ..	17	—	3	8	4	1	1
Female	3	—	2	—	—	1	—

In only five cases was it possible to examine both parents, and they all showed the sickling phenomenon. In another case one parent was available for examination and the erythrocytes also sickled. None of the parents were found to be suffering from sickle-cell anaemia. Twenty-three siblings were examined and five were considered to be suffering from sickle-cell anaemia; three of these five were in one family. The results of the examination of the families agreed with the homozygous theory of the inheritance of sickle-cell anaemia (Neel and Valentine, 1947).

Previous Histories

The previous histories in all cases were strikingly similar. A history of severe recurrent attacks of pain in the larger joints of the limbs was given. The first attacks had occurred in "infancy" in 12 instances, and the latest onset of the attacks occurred at the age of 7½ years. The present number of attacks a year varied from "continuous" to nil, the latter in an African male nurse, aged 44, who stated that the attacks had ceased at the age of 35. In nine

instances it was stated that the attacks became less severe as the patient became older, and in ten the attacks of joint pain were associated with cold weather. Wintrobe (1947) does not mention that sickle-cell anaemia may become less severe with age, but cold weather was regarded as a possible factor in precipitating the acute episodes of sickle-cell anaemia by Graham (1924) and Berk and Bull (1943).

In the Gold Coast, however, cold weather is associated with the rainy season and with an increase in the mosquito population and a corresponding increase in malarial infection. Knisely and Bloch (1942) described massive intravascular agglutination in vivax and falciparum malaria with local haemoconcentration and tissue anoxaemia resulting from the clumping of the erythrocytes. Similar findings were reported in the one case of sickle-cell anaemia they examined. Malaria may thus act as the "trigger" mechanism in precipitating a crisis in sickle-cell anaemia. Intravascular sickling could be produced by the local anoxaemia caused by the malaria parasite, with resultant increased stasis, increased sickling, and a further increase in the local tissue anoxaemia. A vicious circle would thereby be established. The history of a decrease in the number of attacks as the patient becomes older is also compatible with the theory that malaria may be a precipitating factor in the crises—the attacks lessening in frequency as the patient's premunition to malaria develops. It is suggested that in the Gold Coast the association between cold weather and the acute episodes of sickle-cell anaemia are in all probability associated with the greater incidence of malarial infection found during the rainy season.

Symptomatology

Seven of the 20 patients did not complain at the time of examination. The symptoms, in order of frequency, were: joint pains (11), fever (9), nausea (9), headache (5), abdominal pain (4), pains in the limbs (4), pain in the chest and lumbar pain (2), weakness (2), yellow eyes (2), eye complaints (2), dizziness (1), leg ulcer (1), and palpitation (1). In general the symptoms are those usually described in the literature. The eye complaints were, however, unusual, and microaneurysms of the retinal vessels were found in these two patients (Edington and Sarkies, 1952).

Clinical Signs

Eleven of the patients were asthenic and resembled the type of habitus described by Winsor and Burch (1944a, 1944b) with a short trunk and long slender limbs and fingers. "Tower" skull was noted in two patients and mongoloid features in a further two. Jaundice was noticeable in nine and scars of leg ulcers in seven. Active leg ulcers were present in one patient only. The elbow-joint was swollen in one patient and the small joints of the fingers in another.

The heart was considered to be enlarged clinically in five patients. Systolic bruits were present at the mitral area in four and at the pulmonic area in one. The blood pressure was consistently low. The incidence of cardiac complications in this series (25%) is lower than that usually reported, and figures as high as 95% have been recorded (Winsor and Burch, 1945).

Enlargement of lymph nodes was not a striking feature, but small rubbery cervical nodes were palpable in eight patients.

The liver and spleen were palpable in eight and 11 patients respectively. In only one patient was hepatic insufficiency marked, and the bromsulphthalein retention was 35% at the end of 30 minutes. The hepatic insufficiency gradually improved without improvement in the anaemia or in the signs of increased haemolysis. The aetiology of hepatic insufficiency in sickle-cell anaemia is obscure, but has already been described in five patients by Henderson (1950). The diagnostic importance of a palpable liver or spleen in the Gold Coast African is difficult to assess. "Normally" in children the liver may be palpable in 58%, and the spleen in 86%. In adults the figures are lower, and are in the region of 21 and 24% respectively (Colbourne *et al.*, 1950). The spleen in sickle-cell anaemia is enlarged in the younger age groups and diminishes in size with the progress of the disease until only a fibrosed remnant with a characteristic histopathological picture may be found. The spleen in races living in a hyperendemic malarial area follows a similar course, but the histological appearances are different and the small size of the fibrosed spleen in sickle-cell anaemia is not seen. In my opinion no reliance can be placed on enlargement of the spleen or liver as diagnostic points in sickle-cell anaemia in the Gold Coast African.

As already noted two patients revealed aneurysms of the retinal vessels, and dilated and tortuous retinal vessels were observed in a further two.

Blood Findings

The types of anaemia found in the 20 cases were normocytic orthochromic in 7, normocytic hypochromic in 4, macrocytic orthochromic in 1, macrocytic hypochromic in 4, microcytic orthochromic in 3, microcytic hypochromic in 1. These findings are discussed below. The haemoglobin varied from 4 to 14.2 g. per 100 ml. of blood, with a mean of 10.1 g.; the packed cell volume from 14% to 41%, with a mean of 31%; and the white blood cells from 5,400 to 25,300 per c.mm., with a mean of 11,000.

The most striking and constant feature, however, was the presence of numerous target cells in the thin blood smears of each patient. They varied from 32 to 87%. Sickle- or oat-shaped cells were seen in 10 instances and nucleated red cells in 14. The thin smear of one patient contained more nucleated red cells than white. Anisocytosis and poikilocytosis were features of the severe cases only. The reticulocytes varied from 3.4 to 25% and the serum bilirubin from 0.8 to 14 mg. per 100 ml. of blood. The Coombs test was negative in the nine instances in which it was performed. Howell–Jolly bodies were seen in three instances and Cabot's rings in one. The erythrocytes in all instances were more resistant to hypotonic saline than normal controls. The E.S.R. varied from 3 to 40 mm. in the hour, with a mean of 14.

The haematological findings in these cases agree closely with the reported findings of Diggs and Bibb (1939), who reviewed 44 cases. The procedure with the least number of variables in routine haematology is the packed cell volume. Unfortunately this does not hold in sickle-cell anaemia. The rapidity and degree of sickling vary from patient to patient, and the replacement, in varying proportions, of the flexible biconcave disk by a rigid oat- or sickle-shaped cell cannot but influence the packed cell volume. This change also influences the sedimentation rate of the erythrocytes, which is low in sickle-cell anaemia (Bunting, 1939; Diggs and Bibb, 1939; Altmann, 1945). The variation in the types of haemolytic anaemia diagnosed can be explained by this variability of the packed cell volume, from which the absolute values, used in the classification of the anaemia, are calculated. It should also be noted that Diggs (1932), discussing the blood picture in 74 cases of sickle-cell anaemia, stated that sickled cells in a blood smear were the exception rather than the rule. In this series sickled cells were seen in 10 instances only.

Examination of the Bone Marrow

Table IV illustrates the findings in nine patients in whom sternal marrow puncture was performed. The marrow in all cases was of thin consistency, and marrow fragments could not be satisfactorily separated from blood. The recorded results are therefore those of the "haemomyelogram." The nomenclature adopted is that of Israëls (1948). At least 500 cells were counted, and the results are shown in percentages. The cells enumerated under the heading "macronormoblast" resembled superficially the megaloblast, but the nuclear chromatin was clumped in blocks and could not be mistaken for the fine network arrangement of the true megaloblast.

Sickled cells were rarely seen in smears, and target cells were much more common, although in no case did they

TABLE IV.—*Results of Marrow Biopsy Differential Counts in Percentages*

	Case 1	Case 2	Case 4	Case 5	Case 7	Case 10	Case 11	Case 14	Case 19
Haemoglobin in g./100 ml.	9·1	6·1	7·5	7·5	9·0	7·7	4·0	6·6	14·2
P.C.V.	26%	21%	22·5%	26%	25%	26%	14%	22%	40%
W.B.C. per c.mm.	9,000	6,600	14,200	23,000	14,000	5,400	10,000	25,200	6,200
Haemocytoblast	—	0·2	0·4	0·1	0·5	0·2	2·2	0·6	—
Proerythroblast	2·6	3·8	1·6	4·0	2·0	0·6	10·2	5·2	3·6
Normoblast:									
Early	3·2	6·6	2·0	3·0	4·0	1·2	3·6	8·6	4·0
Intermediate	1·8	11·6	5·6	8·0	14·0	14·0	8·2	12·0	7·0
Late	48·6	28·8	50·0	30·0	20·0	18·0	36·4	31·2	28·2
Mitotic	0·8	1·8	3·2	2·0	1·0	—	6·4	3·0	1·2
Macronormoblast:									
Early	—	—	—	—	—	—	—	—	—
Intermediate	—	—	0·2	—	—	—	1·6	—	—
Late	1·6	1·0	7·0	2·0	—	1·2	3·4	4·4	0·2
Myeloblast	—	—	—	1·5	0·5	0·4	2·0	—	2·0
Promyelocyte	1·0	0·8	0·4	2·5	6·0	3·0	5·0	—	6·2
Neutrophil:									
Myelocyte	0·2	1·0	1·0	3·0	3·0	8·0	5·6	0·4	8·2
Metamyelocyte	2·0	3·4	1·4	8·0	20·0	16·0	7·4	3·0	12·4
Polys	25·0	34·2	18·0	22·0	21·0	26·0	2·8	22·4	20·0
Eosinophils (total)	3·0	0·6	—	1·5	1·0	2·0	1·4	2·0	2·0
Basophils (total)	—	1·0	—	0·5	—	0·2	—	0·2	0·2
Lymphocytes	9·0	5·0	6·0	11·0	5·0	8·4	3·4	6·0	4·8
Monocytes	0·2	0·2	0·2	0·5	0·5	0·8	0·4	0·8	—
Plasma cells	1·0	—	3·0	0·4	1·5	—	—	0·2	—
Megakaryocytes	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Myeloid–erythroid ratio	1:1·2	1:1·3	1:3·3	1:1·2	1·3:1	1·6:1	1:2·8	1:2·3	1·1:1

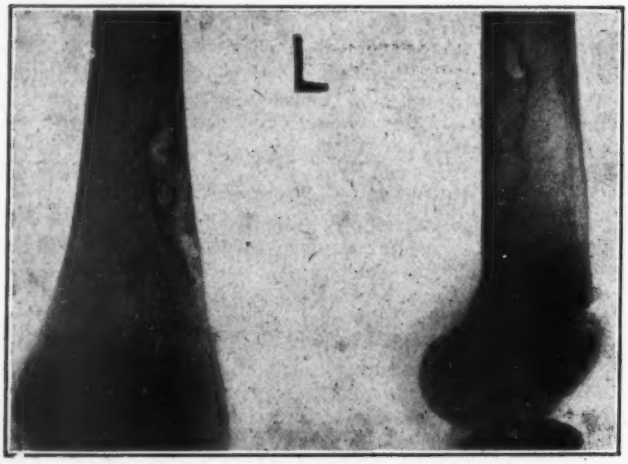
approach the numbers seen in peripheral blood smears. Nucleated red cells were never seen in sickled form in direct smears, although it is known that they are capable of sickling (Herrick, 1910; Sydenstricker, 1924a, 1924b; Diggs and Bibbs, 1939; Watson, 1948).

Malaria parasites were not detected in any of the marrow smears. In all cases a normoblastic hyperplasia was present; the myeloid–erythroid ratio varied from 1.6:1 to 1:3.3.

Radiology

Radiological changes which were considered to be due to sickle-cell anaemia were found in 9 out of the 17 patients who were *x*-rayed. Two mechanisms are thought to be involved in the production of the radiological changes described in sickle-cell anaemia: (*a*) hyperplasia of the bone marrow producing non-specific lesions which have been described in other haemolytic anaemias, the most important being Cooley's; and (*b*) lesions produced in bone by the blockage of blood vessels by sickled erythrocytes, with consequent infarction.

Lesions due to hyperplasia of the bone marrow were seen in nine patients and infarctive lesions were present in three. Absence of a well-defined outer table of the skull with perpendicular trabecular striations radiating outwards from the inner table, giving the "hair-on-end" appearance, was the most common lesion, and was seen in eight patients. A generalized mottling of the ribs with trabeculation in the direction of the long axis and enlargement of the heart were seen in two instances. Infarctive lesions in the femora (see Fig.) were noted in four patients, and changes in the tibia and fibula in one.



Antero-posterior and lateral views of left femur, illustrating an infarctive lesion. Accentuated growth lines can also be distinguished. Case 2.

Treatment

Antimalarial treatment with mepacrine hydrochloride, 0.1 g. thrice daily for five days, followed by proguanil, 0.1 g. thrice daily for five days, was given to the 20 patients without relief, and crises occurred in two patients who were on suppressive proguanil therapy. Salicylates and aspirin did not relieve the joint pains or arrest the condition. Liver and iron therapy had apparently no effect on the anaemia.

In two cases splenectomy was considered for the mechanical relief that was thought might follow removal of the grossly enlarged spleen. It was felt, however, that, in view of the poor results of splenectomy in sickle-cell anaemia recorded in the literature and the absence of readily available blood for transfusion, the risks involved were not justified. One of these patients died some months after discharge from hospital. The cause of death could not be ascertained.

It was considered that the various treatments described above had no effect on the course of the disease in any patient.

Many drugs have been prescribed in sickle-cell anaemia, but few, if any, have proved of value. Diggs (1934) reviewed the literature and personally treated seven cases. Iron, copper, liver, and hog's stomach were therapeutically useless. Murphy and Shapiro (1945) confirmed these findings and added anticoagulants, blood transfusion, and salicylates to the list. Oxygen therapy has also been reported to have little effect on the crises (Hughes *et al.*, 1940). Leivy and Schnabel (1932) and Torrance and Schnabel (1932) believed that the administration of alkali and potassium sulphocyanate relieved the crises, and Grek and Findlay (1951) thought that oxygen inhalation combined with nicotinic acid given intravenously was of help if administered early in the acute crisis. Josephs (1938) reported that the injection of normal plasma or of a protein-free plasma concentrate reduced the rate of blood destruction in patients suffering from sickle-cell anaemia. Kaplan and Lewis (1949) confirmed these findings, but the effect was transitory and tended to reversal with repeated injections.

Course of the Disease

These patients have been followed up for periods varying from two months to four years. Only one patient has died. The remainder have been observed in and between crises. All grades of severity of the anaemia were seen, but even

when the haemoglobin was as high as 14.2 g. per 100 ml. signs of increased haemolysis were constantly present in the peripheral blood and urobilin was present in excess in the urine. One boy aged 16 lost 95 days from school in five acute attacks in the 1948–50 period, and only 18 days in two acute attacks in the 1950–2 period. It would seem that the condition tends to improve with advancing years.

Differential Diagnosis

In the 20 patients investigated a clinical "triad" of a history of recurrent joint pains, many target cells in the peripheral blood smear, and sickling of the erythrocytes has invariably been associated with signs of increased haemolysis in the peripheral blood. In my opinion three important conditions have to be considered in the differential diagnosis. These are acute rheumatic fever, a chronic haemolytic anaemia due to malaria, and so-called "Mediterranean anaemia."

The absence of sore throat, palpable nodules, or joint swellings, or evidence of valvular disease of the heart, with, in many instances, a normal sedimentation rate, eliminates the possibility that this condition is a rheumatic manifestation. In addition there was no response to salicylate therapy.

Malaria parasites were detected in the blood of only four patients and there was no haematological or symptomatic response to malaria therapy in any of the 20 patients. In addition, in five instances the spleen was not palpable and the history of recurrent attacks of joint pain given by these patients was striking, and was not simulated by any of the many hundreds of Africans examined and questioned—all of whom were developing or had developed premunition to malaria. From these facts it is felt that malaria can be excluded from the list of possible diagnoses.

It is difficult to exclude Cooley's anaemia, as, apart from the sickling of the erythrocytes, sickle-cell anaemia and Cooley's anaemia may present an almost identical blood picture in fixed films. Many patients showing target cells in peripheral blood smears were investigated, however, and in no instance was the syndrome described in these 20 patients found in the absence of the sickling phenomenon.

Discussion

If the homozygous theory of the inheritance of sickle-cell anaemia is correct, and if the incidence of the trait in the population of the Accra District of the Gold Coast is taken to be approximately in the region of 19%, by calculation the incidence of the anaemia should be 1%.

I examined 2,255 Africans and diagnosed sickle-cell anaemia in only one instance, giving an incidence of approximately 0.05%. This figure is, however, completely fallacious, as multiparous women, mothers at term, and newborn infants were included in the survey. It is most probable that the incidence of sickle-cell anaemia in mothers at term and in multiparous women is extremely low, as, excluding the mortality from the anaemia in the younger age groups, the primigravida may die suddenly before term in an acute sickle-cell crisis (Edington, 1951). It is also unlikely that the newborn child suffers from sickle-cell anaemia.

In addition, in the surveys the age groups most likely to exhibit the active disease (infancy and early childhood) were, unavoidably, not examined. It is perhaps significant that, in the group of 200 young schoolchildren examined, whose ages ranged from 8 to 12 years, one girl was found to be suffering from sickle-cell anaemia—an incidence of 0.5%. Although I have reviewed only 20 cases in this article, sickle-cell anaemia has now been diagnosed in 33 instances and the sickling phenomenon has been considered to be the cause of death at 13 necropsies (to be published). It can thus be stated that sickle-cell anaemia is not rare in the Accra District of the Gold Coast. It has not been possible to assess the incidence of sickle-cell anaemia, but I consider that the calculated incidence of 1% may well be correct, which would agree with the homozygous theory of the inheritance of sickle-cell anaemia.

Summary

In the Accra District of the Gold Coast 2,255 Africans were examined for the presence of the sickle-cell trait and the anaemia. Sickling of the erythrocytes was present in 407 instances—an incidence of 18.1%. No ill effects were attributed to the presence of the trait in 406 Africans. The remaining African girl was suffering from sickle-cell anaemia.

The case reports of 20 patients suffering from sickle-cell anaemia are discussed. It was found that, in the Gold Coast, a history of recurrent attacks of pain in the larger joints and the presence of many target cells in the peripheral blood smear was invariably associated with sickling of the erythrocytes and signs of increased haemolysis in the peripheral blood. The importance of malaria as a "trigger" mechanism in initiating the crises of the anaemia is considered.

It is concluded that sickle-cell anaemia is not rare in the Accra District of the Gold Coast.

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THE HEALTH VISITOR AND THE FAMILY DOCTOR*

BY

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When I started collecting my thoughts for this paper I rather naturally began by considering the health visitor, but I was inevitably led to the realization that health-visiting work was only an aspect of the increasing service that is now expected from the general practitioner. No doctor who has been in practice over the last twenty-five years can have failed to realize that the conception of general practice has been, and is, changing; it will depend to a large extent upon the attitude of mind of the general practitioner himself if it is to be for the better. The medical profession, with the service it provides, is becoming increasingly important as a prop to the general weal of the nation; it must also be remembered that over the years we, as doctors, have been largely allowed to keep our own house in order. The number of Acts of Parliament regulating the profession of medicine has been very small. The first Acts I know of occurred in the time of Henry VIII† and simply said who could be allowed to practise medicine under certain conditions. The next Act was in 1858‡ and tightened up the controls, made more formal arrangements for entry into the profession, and provided, through the General Medical Council, for doctors who misbehaved to be taken off the list. Then we had the National Health Insurance Act of 1911, and the scope of this Act was much widened by the National Health Service Act of 1946. This last Act not only laid certain duties upon the doctor but by the comprehensive nature of the Act, and the associated obligations laid on the local authorities, increased the scope of the doctor's responsibilities.

There are, of course, other Acts which have affected doctors, and Parliament, through the Midwives Acts and the Nurses Acts, has provided assistants for him and arranged that they are adequately trained.

Although up to a century ago nurses were often disreputable, there has been little difficulty in their relationship with doctors: Florence Nightingale was more than a match for any man, even a doctor, and her influence remains.

It took a long time for the midwives and the doctors to settle down together; in the eighteenth century there were some very acrimonious discussions with midwives proper and the so-called "men midwives," who were beginning to make their presence felt. I cannot refrain from quoting William Smellie, about 1750, regarding the conduct proper to a midwife, for it is surely applicable, with obvious modifications, to the relationships between doctors and their other handmaidens:

"She ought to be a decent, sensible woman of a middle age, able to bear fatigue and well instructed in the elements of practical midwifery.

"She ought to live in friendship with other women of the same profession, contending with them in nothing but in knowledge, sobriety, diligence and patience; she ought to avoid all reflections upon men practitioners; and when she finds herself at a loss, candidly have recourse to their assistance—this confidence should be encouraged by the man who ought to rectify what is amiss without exposing her mistakes.

"These gentle methods will prevent that mutual calumny and abuse which too often prevails among the male and female practitioners, and will redound to the advantage of both, for no accoucheur is so perfect but that he may err sometimes."

One is now led to wonder why the health visitors—the other assistants—have been introduced into the medical scheme of things. As I have pointed out, the scope of medical practice has widened—almost entirely owing to the work of the profession. The family doctor now appreciates that the full therapeusis of a sick person includes the welfare of the patient's family. The cure of the actual ailment and the full economic and medical recovery of the patient are often associated with such matters as the patient's occupation, his housing, his financial position, his relationship with other members of his family, and other medico-social aspects of the case. If the general practitioner loses sight of these facts he is in danger of ceasing to be the family doctor.

General practice as I knew it thirty years ago was largely a matter of medicine and personality. A country practitioner for whom I worked was an outstanding man, and combined a good knowledge of medicine with the means of meeting many of the social responsibilities of ill-health in his patients. I am quite certain he would not be able to do it now. Personality and integrity are still as important, but medicine is not merely a matter of medical therapeutics—it must include social therapeutics.

The widening outlook has been obvious in the field of hospital practice, where the hospital practitioner is buttressed by an increasing army of auxiliaries—almoners, physiotherapists, dietitians, occupational therapists, and others. The same has been happening in general practice—for have we not there the children's officer, the probation officer, the N.S.P.C.C. officers, and others?—but in the subject of our talk we also have a key worker, one who can assist the practitioner to deal rationally with these other useful auxiliaries, and one who can also help the practitioner himself.

How the Health Visitor can Help the Doctor

I would therefore like to introduce to you the health visitor and let you know how I feel she can help you in your work. First of all, it is not always realized what a well-qualified and well-trained person she is. She must (1) be a fully trained registered nurse; and (2) have taken at least the first part of the midwifery certificate (as a matter of fact most health visitors are fully trained midwives and have worked as such); and (3) have passed an examination following a nine-months course in social medicine, including a knowledge of infant and child care, welfare work in relation to the disabled and the aged, maternal care; personal, domestic, and community hygiene, including household management; together with knowledge of social, industrial, and economic conditions and of the means of teaching.

*Read in opening a discussion in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association, Cardiff, 1953.

†(*a*) The Physicians Act, 1540 (32, Hen. 8, C. 40).—The Act exempted members of the Fellowship of Physicians from having to undertake the duty of constable, and allowed physicians to practise medicine in all its branches. (*b*) The Herbalists Act, 1542.—In order to avoid "Sorceryes, witchecrafte and other inconveniencies, it was enacted that no p'son within the Citie of London, nor within seven myles of the same, shoulde take upon himself to exercyse and occupie as physician or surgeon, except he be first examyned approved and admitted by the Bisshopp of London," etc.

‡The Medical Act, 1858 (21 and 22 Vict. Cap. 90).

I have analysed the qualifications of about 370 health visitors in some of our largest cities. Apart from the qualifications mentioned above, which they all possess, a number of them have also been trained and had experience in fever nursing, orthopaedics, housekeeping, tropical diseases, nursery nursing, the care of the tuberculous and mental cases—a few hold a higher qualification such as a tutor in public health training, the diploma in nursing, or are Queen's nurses. Taking gross populations, there appears to be about one health visitor per 9,000 of the population in these big cities. There will therefore be in this 9,000 about 130 births per annum, and about 500 children under school age; there will also be about 900 persons over the age of 65, a number of whom require some constant supervision. Apart from these there will be disabled persons, both young and old, problem families, and tuberculous patients. It is no light task helping to keep this mixed family under observation and to provide for them, but the health visitor's training equips her to do much for them, although I know only too well the magnitude of the task and the severe shortage of health visitors that exists.

The general practitioner will obviously want to know what assistance he can get from the health visitor. In a talk such as this I can only indicate the various fields where she can assist the doctor through her intimate knowledge of the family, or by invoking the assistance of other voluntary or statutory organizations. In many towns the health visitor is already carrying out the work I shall mention. I would like her to do this in a closer association with the family doctor. Before proceeding, I may remind you that the health visitor trained as a nurse is fully aware of her ethical obligations towards any patient she visits.

1. Care of the Mother and Child

This has been the primary function of the health visitor for over a hundred years when society in general was little concerned regarding the health and happiness of women and children. Although uninvited, and with no statutory right of admission to a home, the health visitor has been instrumental by her knowledge and perseverance in promoting the welfare of mother and child, and surely the husband also. The health visitor can assist the doctor in seeing that his advice on infant feeding and the care of premature children is followed, and in dealing with minor ailments and maladjustments. The continuing oversight of problem families, who cause such expense to the nation and such trouble to society, has been safely entrusted to her, although she would welcome some guidance and encouragement from the doctor.

The anxious mother welcomes the opportunity of discussing her difficulties with a knowledgeable person. These mothers ask questions and seek advice. How much better it would be if the health visitor knew that she was reinforcing the opinion of the family doctor. When emergencies occur—a mother is ill at home or has to leave a family to go to hospital—the health visitor can be left to do all she can to provide assistance. Then there is the preparation of the family for the return of a patient from hospital, sometimes imperfectly cured, needing special attention, diet, or care. Health visitors are encouraged to make direct contact with the hospital almoners so that there is a continuity of care.

Sometimes the aid of specialist agencies must be invoked—the children's officer, the probation officer, the N.S.P.C.C., and the doctor's time can often be saved by requesting the health visitor to make the necessary arrangements with these persons.

2. The Aged

Every general practitioner has a quota of persons who are old and, as a consequence, more frail and subject to disabilities, and more in need of friendly assistance, care, succour, and comfort. We are encouraging our health visitors to keep these elderly people under supervision, report to the general practitioner when a special need arises, and ask for his assistance when a question of the disposal of these old people, either to an old persons' home or to a hospital, arises. The health visitor will, with his permission, call in a district nurse or suggest the need of a domestic help. Very often, in cases of inattention, arrangements can be made for the old person to be bathed, for the home to be cleansed, and for laundering the linen. The health visitor also frequently arranges for relatives to be informed of the condition of one of the elderly members of their families.

During the period of shortage of beds, either for the chronic sick or for the old people's home, the health visitors are asked for an assessment of the patient's "social" needs in assessing priorities for accommodation. I would much prefer that this was done with the assistance, or at the request, of the general practitioner, and, in fact, in my city it is an invariable practice for the general practitioner to be informed of the opinion of the health visitor regarding the disposal of such a case. Very often the health visitor is able to provide assistance to the elderly people by making their needs known to the Assistance Board or the Ministry of National Insurance, to invoke the assistance of voluntary agencies such as the "meals on wheels" service, or to arrange for assistance in shopping.

3. The Disabled and Handicapped

I very much doubt if a large number of general practitioners are aware of all the agencies that are willing and anxious to help disabled persons. Knowledge of these agencies can often lead to the provision of necessary help and comfort; not only that, but the local authority itself has an obligation to promote the welfare of the disabled, who include many aged persons. Special arrangements are also in force for caring for the mentally handicapped, both psychiatric cases and mental defectives. There are special visitors to provide for the particular needs of blind persons. As time goes on it will be possible to provide training in new work, occupational therapy, arrangements for the sale of goods made, for recreational facilities, for clubs, and so on. One of our big difficulties at the moment is to know the number and needs of persons in the different categories, for special facilities are often necessary to deal with special disabilities. The local authority would welcome information from the general practitioner, and much of the investigation of the case can, to begin with, be undertaken by the health visitor, especially if she has the co-operation of the doctor. The family health visitor is the general social worker; she will call for the specialist social worker—the psychiatric social worker, the probation officer, the home teacher for the blind, etc.—when necessary. With one key worker the number of visitors can be reduced.

In some cities, particularly in Cardiff, there are specialist health visitors dealing with certain types of aftercare. Specially trained health visitors visit diabetic cases, cases of gastric ulcer, and so on, in order to ensure that the regime prescribed at the hospital or by the doctor is being followed; but practice varies in different areas.

4. Tuberculosis

As our therapeutic advances begin to show a result it is likely that we shall have more cases of chronic tuberculosis on our hands, and not all of them can be contained in hospitals. The health visitor, working either as a specialist tuberculosis visitor or as the family-care worker, can see that the instructions of the general practitioner, the chest physician, or the medical officer of health, in relation to prevention are followed. She will see to it that the child is segregated where necessary, that contacts are shepherded to the chest clinic for investigation, and that extras, whether from statutory or voluntary agencies, and any special allowances which are necessary for the tuberculous patient himself, are

obtained and properly used. Tuberculosis is a chronic disease presenting a great variety of problems taxing the resources of the doctor and the local authority. Non-medical problems of finance, housing, and employment are frequent, and opportunities for discussion of a case with a social worker such as a health visitor must be very useful.

5. Accidents

As infection and other disease of childhood are becoming less prevalent it is surprising how accidents have emerged as a major cause of death and injury. Accidents in the home are very numerous. We are arranging for our health visitors to obtain as full information as possible about these, and to advise the mother how best to prevent recurrences.

Obligations of the Local Authority

I have pointed out the social and economic repercussions of sickness and the many agencies that are available to assist. The obligations of the local authority are very important: it must provide midwives, district nurses, home helps, and an ambulance service, and is encouraged to provide "care and aftercare"—a territory insufficiently explored but full of possibilities, both for the patient and for the doctor. A social worker like the health visitor can, with the doctor's assistance, make the needs known to the local authority.

A frequently heard complaint is that there are too many persons, representing well-intentioned and often necessary organizations, knocking at the door of the harassed housewife requiring information or offering assistance. I have counted over twenty such organizations in my own city. It is surely a waste of time for them to call indiscriminately. I would like to use the health visitor as a funnel, which, with the doctor's assistance, could be concerned with the economic deployment of these agencies. She could do this if she knew she was the accepted assistant of the doctor.

I have spoken of the health visitor in a city, but I know very well that in a country area, where the health visitor is also the district nurse and also the midwife, a close association has already evolved, and there is a good understanding between the doctor and her. It is not so easy in a town. The doctor may not know where to get hold of the health visitor, and hesitates to bother with officialdom in the town hall. We, as medical officers of health, are always ready to help, and would respond to any request from the doctor or the patient—and it often happens in this way—but I would much prefer that the contact was direct between general practitioner and health visitor. No general practitioner in Sheffield thinks of getting in touch with me when he wants the services of a district nurse or a midwife, and I am not particularly interested in supervising the day-to-day work of the health visitor.

It would save much trouble if the health visitor and doctor dealt direct with one another, either by telephone or in person, or that there was an arrangement for a regular transmission of information as required. No doctor thinks it necessary to provide his own midwife or district nurse; and, indeed, the State, appreciative of the value of these women, arranges to provide them and for the local authority to pay for them. The health visitor is in exactly the same position, and although the local authority engages her, supervises her, and deals with her terms of service, she is there for the good of the public, and in particular for the help that she can give to the general practitioner, who is primarily concerned with the care of the sick person and the welfare of his family.

Finally, although I have stressed the importance of the personal association between the doctor and the health visitor, I would like to say that this co-operation could be much better brought about if there was a closer association between the general practitioner and the medical officer of health and his medical staff. Both of us have our responsibilities to the patient, and we all have, I hope, the same desire to serve.

THE GENERAL PRACTITIONER AND THE HEALTH VISITOR*

BY

J. STANLEY THOMAS, M.R.C.S., L.R.C.P., J.P.

General Practitioner

During my 30 years in general practice I have had the advantage of a happy family partnership and the privilege of having practised medicine in an era which exemplified Mr. Churchill's dictum, given to a Royal College of Surgeons gathering, that the "longer we look back the further we can look forward," for we have seen more striking advances than could have been thought possible, among which must be counted the present liaison that is developing between those engaged in preventive medicine and general practitioners.

All my days the medical officer of health, owing allegiance to the local authority, has been respected as an administrator and regarded as an able colleague having specialized knowledge of infectious diseases, but whose duties in the main were no concern of ours. During my early years of practice, apart from social contacts, relationships between the work of the general practitioner and the medical officer of health were poor, and my then seniors in practice regarded welfare clinics as a form of subsidized competition which they disliked and mistrusted. In fact, in populous areas the work of the whole-time medical officer and that of the general practitioner were poles apart.

Let it be remembered, however, in arriving at a true conception of the picture, that the general practitioner was, in the main, a single-handed individualist, and obviously the time was not then ripe for the liaison we envisage to-day.

Nursing, the Keynote

The value of nursing has, to my mind, been paramount in the conduct of a practice, and I believe that nursing is the keynote to its success. I have had the advantage of having the same nursing sister with me for over a quarter of a century. At an early date I realized that her value was not just that of a nurse whose duties I understood and who officially carried out my treatment. The knowledge of the lives and habits of our patients which she gleaned and passed to me, and of the effect of their social problems on their illnesses, gave me an understanding which was invaluable in appreciating and treating their real difficulties—a knowledge which I had never encountered, or even considered, in my impersonal hospital life. It was she who revealed that a large proportion of patients who consulted us without physical signs, or who did not make progress, had financial, marital, or other family problems. It was she who comforted the pregnant single girl, and advised all patients, from the young mother to the aged sick, in those problems which were outside my clinical approach. She assisted in running our own infant clinic and became the confidant and friend of the parents, and, of course, of the children, who are now our second generation of patients. I suppose that, in the confines of one practice, this was the forerunner of social medicine and the liaison between doctor and health visitor as we are beginning to understand it to-day.

I am sure that all interested parties agree that the closest possible co-operation exists between the general practitioner and the nursing profession so far as the district nurse and the midwife are concerned. In my own area, with a popula-

*Read in opening a discussion in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association, Cardiff, 1953.

tion of 120,000, the district nurses made over 60,000 visits last year. Without their co-operation and invaluable help a reasonable standard of efficiency in general practice could not be maintained in these busy days. In my first ten years in practice the "Gamp" still survived, and one had to fight hard to convince patients, even the intelligent ones, that trained nursing was essential to their safety. It is unthinkable that midwifery would be possible to-day without the closest co-operation between doctor and trained midwife.

Necessity for Liaison

It is with the public nurse—the health visitor—that lack of liaison is still so apparent, and some of the reasons become obvious when the problem is studied. Health visitors have always been the employees of the local authority, acting under the jurisdiction of the medical officer. They have worked in clinics, which, as we have said, were not looked upon with favour in the days of competitive practice, and they are a comparatively recent innovation, for it is only since 1919 that the health visitor has been recognized by the Government as an integral part of the social welfare structure. Study of their training syllabus and examination papers shows that primary qualification as a hospital-trained nurse and midwife is a requirement, followed by an intensive course of specialized nursing and social welfare; and this skill and competency has been kept, as it were, in the watertight compartment of the public health department. (In fact, many are actually unaware that a health visitor is primarily a trained nurse.)

The busy general practitioner, concerned with the treatment of minor ills and the diagnosis of major ones, can be pardoned for giving little time or thought to preventive medicine. This, he felt, was the sphere of others, and thus he never reaped the benefit of contact with that branch of nursing—except, unfortunately, when advice given in the local authority clinic conflicted with his own and often created antagonism. If I may again speak from personal experience, it was in the field of tuberculosis that my colleagues and I first saw the real light of day in preventive medicine. In 1921 a physician was appointed by our local authority to take charge of this sphere who, if I may say so, was many years ahead of his time. He eliminated the concept of the tuberculosis dispensary and inaugurated a "chest clinic"—a title which to-day is finding favour everywhere. He pioneered extensive *x*-ray investigation, but he had, too, the foresight of social medicine, and encouraged all general practitioners to attend his clinics, and, to complete the liaison, brought them into contact with his enthusiastic sister in charge.

It was she who saw to it that she and her nurses were in touch with the patients, not just in the clinic but in their homes. She took a quite revolutionary step in making every possible contact—by telephone and personal visits—with the general practitioner, and it was she who gave us a vivid picture of how the social conditions of the home intensified the problems of the afflicted. The same sister still reigns, and with the recent enormous advances in the treatment of tuberculosis the liaison with the general practitioner, who now comes more than ever into the picture in this antibiotic era, has been firmly cemented. It is the welfare nurse who so impresses upon the patient that it is the family doctor who is to the forefront in this field. If I may digress, the value of that liaison has been exemplified in placing in suitable employment an ever-increasing number of tuberculous people who are fit to return to work; for there is contact via the chest clinic, the general practitioner, and the health visitor, so that details of the social environment, as well as the medical problems, are placed in the hands of the Ministry of Labour.

The 1946 Act, by opening the watertight compartments into which the care of the patient had gravitated, will ultimately revolutionize the practice of medicine and thus alter the whole conception of the broad issue of medical care. It was not until 1948 that the preventive sections of medicine and the general practitioner began to work together in harmony, to the great benefit of the public.

The obvious key to this liaison is the health visitor, and the section of the Act which enlarged the duties of health visitors was in this respect visionary. I think we can prophesy that in the near future she will be regarded as invaluable as the district nurse in the conduct of modern practice.

What must be done, therefore, to accomplish this liaison? First, the general practitioner has to be satisfied—and many are not—that the work of the public health nurse is indispensable to him. When the doctor examines his records he will surely find, at a modest estimate, the great majority of his patients have been discovered, after hospital investigation, to be without physical signs of organic disease—perhaps a real justification for the general practitioner, for it is this majority who need his services and not that of specialism. When we come to analyse the matter, what do we find? The problems of the young mother, whose difficulties in infant feeding and whose natural anxieties due to inexperience cause her to need a good deal of comfort and advice, for which, although qualified to do so, the practitioner rarely has the time to give. We find, too, home problems which, undisclosed and unravelled, tend towards disharmony and discord, delinquency and mental ill-health, only too often reaching the psychiatrist, when they might have been dealt with much more effectively at an earlier stage.

Excursions into juvenile court magistracy gave food for thought when I recognized delinquent children and truants as cases which had been seen in the surgery and to whose problems I had neither a clue nor time to elucidate them. How often do those requests for a "tonic"—bromide and phenobarbitone sedatives—mask a state of affairs which the patient is unwilling to disclose to a busy doctor? Where active disease is concerned, only too often extensive measles and whooping-cough epidemics, a high incidence of tuberculosis, etc., are due to overcrowding and unsuitable home conditions. In such cases the health visitor would be invaluable in assisting in diagnosis and treatment—for example, she might find that immunization and vaccination had been postponed or neglected; might help the tired mother, often the subject of chronic ill-health and anxiety states, but responding quite satisfactorily to common-sense help and advice; might advise in the problem of the parent returning too soon to household duties or full employment following parturition or hospital treatment, by arranging necessary convalescence or home help. How many practitioners are aware, while recognizing that overcrowding is responsible for much mental and physical ill-health, that the rehousing of families by the local authority is often contingent on reports given by health visitors?

The Aged and Chronic Sick

It is my belief that much can be done for the aged and chronic sick by health-visitor liaison. The ventilation of this problem in Parliament and elsewhere has brought us face to face with the fact that the aged population is living longer and increasing numerically to an extent that may affect our whole social system. I found some excellent advice on this subject in a brochure issued by the Bristol Local Medical Committee. The 1946 Act, with its obliteration of the Poor Law hospital, however progressive it may have been, virtually cost, in my area, the use of 1,000 chronic-sick beds, and the general practitioner who prior to 1948 could easily lodge his chronic sick is now faced with a grave problem; for in spite of the excellent treatment afforded to a few in a geriatric unit, they cannot be accommodated in hospital. Also, the public has not yet been educated to this abrupt alteration, which has come to stay, and I feel sure that here the health visitor can do much by giving advice regarding hostels and by discussing with the family the problem that arises when the rest of the household are at work and unable to cope with the inevitable series of illnesses of old age, so rarely well

managed at home. The influence of a nurse, and her manner of approach, will do much to assist the aged who decide to maintain their sturdy independence by continuing to live at home; and by her contact with home helps, and often by tracing relatives, will be able to give invaluable service in this direction.

A Changing Phase

The changing phase of general practice, in which the practitioner will work in and with local authority services, will make the health visitor an essential factor, but the practitioner cannot assess the value of this ancillary service unless he has the means to study it; in effect he must have access in one way or another to local authority services. The Birmingham plan, published in the *Lancet* of April 5, 1952, is based on the assumption that general practitioners will work in local authority clinics. My visit to Birmingham was amply repaid by the courtesy and help afforded by the medical officer of health. (All good general-practitioner members of the B.M.A. should make pilgrimage to Birmingham, for it provides the vast majority of their leaders.) Birmingham regards the present services of local authorities as outmoded because they were inaugurated at a time when it was their duty to provide such services for those who could not afford them, and because the passing of the 1946 Act, which gives full facilities to the whole population, alters the entire position. The time is approaching when the general practitioner will, in the first instance, be the person responsible for the treatment of the family unit, and when the employment of junior staff by the medical officer of health's department for clinical duties will cease. The success of the scheme in Birmingham is obvious; Croydon, too, has an excellent liaison which enables the general practitioner to work in clinics if he so desires.

In my own area all clinics are open to practitioners, so that they may use the clinic or staff for antenatal and post-natal care of patients, utilize the special services of the local authority such as physiotherapy for the pregnant mother, seek the help of the child guidance clinic, invoke the aid of the dental *x*-ray department, and have access to special departments for speech therapy, etc.; and this, combined with access to the chest clinic, gives great opportunities for further services to their patients. Thus practitioners will appreciate the value of the health visitor. Liaison of even the senior generation of doctors with the health visitors can be rapidly inaugurated by social contact, which will soon establish the happy relationship which always exists when doctor and nurse work together. But I feel it should be stressed that the practitioners must learn to regard the health visitor as an ancillary who has a highly specialized knowledge collateral with his own, not merely as a nurse acting under his official directions. So far as the younger generation of practitioners are concerned, they will come to regard health visitors as indispensable.

The student now sees them in the wards of hospitals, doing the rounds with him so as to assess the social after-care; but unless he meets them subsequently, the inestimable value of their knowledge is lost to him. Surely he will now enter practice, work when he so desires at adequately staffed clinics, and in the sphere of social medicine will have the advantage of calling upon the health visitor for the elucidation of his problem and of keeping contact, because he will meet her in the course of his work. His obstetric work will be immeasurably helped by meeting, through the offices of the health visitor, the midwife, either at the clinic or in his own surgery; and the present position will be improved, for only too often the general-practitioner obstetrician does perhaps two of the "antenatals" and the nurse the others—the two never meeting except in a possible emergency at a confinement.

Conclusion

Although enthusiastic about this subject, none of us would be so foolish as to suggest that health visitors are the complete solution to the many problems of practice, for history teaches that enthusiasm is invariably followed by a stage of caution; but the most conservative would agree that in a large proportion of the cases which constitute our life's work and in which we need and would welcome assistance, this is waiting for us on our doorstep. May I say, too, that the use which is made, in certain areas, of open access to pathological services is so much less than was forecast that those in charge of administration in local authority need have no fear, in the first instance, that they would be overwhelmed by demands on their health-visitor services.

However, as the Minister said at Scarborough, it is the general practitioner who must captain the ship. It is not for him to evade his responsibilities but to increase them—because he has the necessary help. It is my belief that closer contact with the nursing profession must raise one's own standard; and I understand that, already, general practitioners who are working in clinics are becoming keen on postgraduate instruction that will keep them abreast of their subject when working side by side with health visitors.

So the doctor of the future, if he decides on general practice as a career, must realize that one of the most important factors in helping him to maintain personal contact with his patients, to understand their difficulties, and to guide those whose problems are not purely of disease but of social background, will be a firm liaison with the health visitor.

Finally, may I express my gratitude to the medical officer of health for East Ham, and his health visitors, past and present; for, without their invaluable help and co-operation and his advice to his authority to make liaison with general practitioners by offering the use of local authority services, this paper, however imperfect it may be, could never have been presented.

HYDROCORTONE AND SOFT-TISSUE LESIONS

BY

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The formation of painful scars in the moving parts of the body is a common cause of disablement. Non-specific inflammation of fibrous tissue follows injury or overuse and characterizes also the rheumatoid disorders.

Though there had been no satisfactory way of dealing with rheumatoid trouble, the problem of the painful scar due to trauma had been largely solved by the elaboration of manual methods. By means of deep massage in some cases, in others manipulation, it has proved possible to restore painless mobility, but it is usually a laborious business. For example, we have hitherto been quite satisfied with cure of tendinitis at the shoulder in say six or eight sessions, or tennis elbow in four to six sessions, since the breaking down of fibrous tissue in strong deep-seated tissue demands time and considerable ability and experience on the part of qualified personnel.

The fact of painful treatment, obtainable only from a minority of physiotherapists who have had special training in these techniques, naturally calls for constant exploration of alternative measures for dealing with

lesions of muscle, tendon, ligament, and joint-capsule. Fifteen years ago therapeutic local analgesia was extensively tried, but in the end we found it suited to only a few muscle lesions, to ligamentous injuries during the first day only of their occurrence, and, introduced epidurally, to some cases of low lumbar disk lesion. More recently we have experimented with short-wave diathermy and ultrasonic waves, and found they afforded no benefit in these disorders. When cortisone became available this was tried for its systemic anti-inflammatory effect, but it proved useless in non-rheumatoid conditions. However, hydrocortone, applied locally, has given excellent results.

Hydrocortone Acetate

This is supplied by Merck in 5-ml. phials containing in sterile suspension 125 mg. of the hormone. Hydrocortone has the same anti-inflammatory effect as cortisone, but exerts a local action. Hence it can be injected in small amount at infrequent intervals. It seems that no more need be injected than is required adequately to reach the whole affected tissue.

We were anxious to find out if hydrocortone could be used as effectively in traumatic as in rheumatoid inflammation. Since the reaction to aseptic injury is always excessive, we sought to control it by topical application of the hormone. We have found 25 mg. injected into the joint adequate for the shoulder, hip, and knee; 10 to 15 mg. for a tennis-elbow. After injury the cause of the inflammation is not, as in rheumatoid conditions, a continuing state; once the inflammation has been abolished there is nothing to reactivate it. Hence one or two injections suffice for those traumatic disorders in which hydrocortone is effective.

Since scarcity, expense, and possible toxicity with large doses all dictate that only small amounts of hydrocortone should be used, the importance of deciding on the exact site of the lesion is obvious. Hence the same system of diagnosis that originally enabled us to prescribe deep massage to one small point becomes more important than ever; for the 0.5 to 1 ml. of hydrocortone has to be injected into one precisely defined spot.

Diagnosis by Selective Tension

Tension brings on or aggravates pain in lesions of the moving parts. The approach is indirect and depends on assessment of function. Hence the diagnosis is arrived at by applying selective tension on each of the moving tissues in turn. From these responses a pattern emerges that identifies the precise tissue at fault. Search for tenderness is avoided so far as is possible, and, if it proves necessary, is confined to the structure already identified by this study of function as containing the lesion. When a number of movements are tested, some are found to be painful, weak, or limited, others normal. The negative side of the examination is as important as the positive, since, if one movement indicates that a lesion lies in a certain position, it follows that all movements that do not affect that part of that tissue must be of full range, painless, and strong. Hence interpretation is based on the pattern—that is, positive findings at one point balanced by negative findings elsewhere.

The main distinction when the moving parts are examined is between the contractile structures (muscle and tendon) and inert structures (capsule, ligament, bursa, dura mater, nerve-root, or nerve-trunk). Resisted contraction applies strong tension on muscle and tendon; stretching in the opposite direction may hurt too. Pain arising from inert structures appears on stretching only.

Examination of Function

Five different sets of data are correlated, as follows:

1. *Active Movements.*—These give a combined indication of the range of movement, muscle power, and state of voluntary control. Since range and power are assessed separately later, their chief virtue is to indicate willingness. Marked discrepancy between the range of active movement on the one hand and, on the other, the range of movement and muscular strength indicates psychogenic disorder.

2. *Passive Movements.*—These indicate the state of the inert structures without introducing complications due to muscle power and willingness. *Capsular pattern:*—If the entire fibrous cuff about any joint is found contracted, arthritis is present. The limitation of movement found corresponds to the capsular pattern. This is different for different joints, but maintains constant proportions at any one joint. For example, in arthritis at the shoulder, if abduction is, say, 45 degrees limited, lateral rotation will be 60 degrees limited but medial rotation only 15 degrees limited. *Non-capsular pattern:*—If the known proportions are not found, ligamentous sprain, internal derangement, bursitis, neoplasm, contracture of an extra-articular structure, or hysteria is present.

3. *Resisted Movements.*—One movement is tested for each group of muscles, and such a degree of resistance is applied that the joint itself does not move. The state of the muscles is thus assessed in isolation. If a full range of movement exists and only one resisted movement hurts, a muscle lesion is present. If several contradictory restricted resisted movements hurt, the muscles are unaffected. Painless muscle weakness without increase of pain characterizes complete rupture or a neurological condition.

4. *Painful Arc.*—If a tender structure lies between two bony surfaces it can be painfully squeezed when they are approximated. A painful arc results—that is, pain at mid-range of a movement disappears as the extremes are approached. For example, in supraspinatus and infraspinatus tendinitis, and in subdeltoid bursitis, the lesion lies between the acromion and the greater tuberosity of the humerus. Therefore, tenderness of any of these three structures may give rise to a painful arc. In the case of the tendons, the arc is associated with pain on resisted abduction and lateral rotation respectively. If the bursa is at fault neither resisted movement hurts. Since the simplest anatomical considerations indicate clearly where the tissue, since it is pinchable, must lie, an arc is a valuable localizing sign.

5. *Palpation.*—This may reveal warmth; if so, the finding indicates an active lesion. It occurs with recent injury or operation, fracture, internal derangement, neoplasm eroding bone, blood in the joint, rheumatoid or gouty arthritis, and bacterial infection. Fluctuation indicates fluid. Synovial thickening, crepitus, loose bodies, cysts, osteophytes, and bony enlargement are detectable. Tenderness serves to indicate the exact site of a lesion only if palpation is confined to the tissue already singled out by study of the diagnostic movements as that affected.

6. *Confirmation.*—Radiography seldom clarifies a diagnosis in lesions of the soft tissues and may prove most misleading; hence the paramount importance of the clinical assessment of function. Local analgesia provides the only means of disproving or confirming a localization arrived at clinically, and in all cases of doubt should be induced at once. After the injection whatever movement had been found painful is tested again. If the right spot has been reached this movement remains painless for one to two hours. Once the right spot has been found—if necessary by repeated small infiltrations—the hydrocortone can be injected the next day.

Choice of Cases

Most soft-tissue lesions of the moving parts respond rapidly to the standard methods used in orthopaedic medicine—deep massage, manipulation, traction, and therapeutic local analgesia (Cyriax, 1950). Thus we have selected for treatment by hydrocortone patients who either had failed to respond to our normal procedures or lived too far away to attend for such treatment.

Technique

Intra-articular injection presents little difficulty except at the shoulder. At the smaller joints, traction is useful to form a gap into which the needle can pass.

Shoulder.—The patient lies prone, the forearm on the affected side under his abdomen. However arthritic a shoulder-joint, this position is not painful; and it secures fixation of the humerus in slight medial rotation. The operator identifies the posterior bony projection lying at the point where the acromion and the spine of the scapula meet at right angles. He selects a spot 1 cm. below this point and thrusts in a thin needle 5 cm. long. He identifies the coracoid process anteriorly and aims the needle directly at it. He feels nothing as the needle traverses the fleshy infraspinatus, but the capsule of the joint offers clear resistance. Once the capsule of the joint is pierced the needle becomes embedded in articular cartilage—another characteristic sensation, quite unlike the impenetrable surface offered by bone. If the operator wishes to be doubly sure that the needle lies intra-articularly, he can pierce the capsule in several adjacent spots until resistance to the needle suddenly ceases and it passes easily to its full length between humerus and glenoid. 25 mg. of hydrocortone (1 ml.) is now injected.

Results

Shoulder.—Between us we have treated 21 cases, as follows: freezing arthritis, 9; infective arthritis, 6; post-traumatic capsulitis, 3; post-operative adhesions, 1; immobilizational capsulitis, 3; subscapular tendinitis, 1. The hope that an effective treatment had at last been found for freezing arthritis was again disappointed. The results were largely negative, and in several patients seen when the arthritis was in the early part of the first stage the disorder was uninfluenced, and progressed in the usual way towards increasing pain and limitation of movement. In one case no less than 125 mg. of hydrocortone was injected in the course of a month without effect. By contrast, the six patients with infective arthritis reported immediate relief. The constant pain ceased by the same evening, and the patients were able to lie on that side at night for the first time for months. The range increased, and so far (maximum seven months later) there has been no return of symptoms.

In the cases following trauma and immobilization the results were generally good and patients with lesions in the active stage (that is, unsuited to the physiotherapist's repeated gradual stretching) were brought within a fortnight to the point where this could be undertaken with success. Months of disablement were thus avoided. In the post-operative case (stiffness following operation for recurrent dislocation) no benefit resulted. The patient with subscapular tendinitis responded well. He had had two months' pain, and six days after injection of 1 ml. of hydrocortone had lost his symptoms; these have not returned.

Tennis and Golfer's Elbow.—These cases number 14: teno-periosteal tennis elbow, 9; tendinous tennis elbow, 3; golfer's elbow, 2. These disorders provided our most consistently spectacular results. We confined our treatment by hydrocortone to cases in which the lesion lay at the teno-periosteal junction or in the body of the common extensor tendon itself. Only 0.5 ml. of the suspension was used. Ten days after the injection 10 patients were playing tennis again painlessly. In the two remaining cases relief was incomplete, but cure followed a second injection. Two cases of golfer's elbow (strain of the common flexor tendon at the medial condyle) were fully relieved by one and two injections respectively. As a precaution (possibly unnecessary) patients were asked not to exert the wrist during the first few days after the injection, so as to give the anti-inflammatory action of the hormone a favourable environment for its action.

Knee.—Infective arthritis, 2 cases; sprained coronary ligament, 1 case. Infective arthritis of the knee had been present for two months in a woman of 26 years. After the injection the heat, fluid, and synovial swelling almost disappeared for a week, and then returned rather more so than originally. By contrast, three fortnightly injections of 1 ml. suspension into a hot, swollen, painful knee of two years' standing had an excellent result, which has now lasted two months. The coronary sprain was of two months' standing. The ligament was infiltrated with 0.5 ml. of the suspension. Within a few days the symptoms ceased, but a small effusion remained. This was abolished by 1 ml. injected intra-articularly.

Miscellaneous.—One case of sprain of the deep aspect of the acromio-clavicular joint responded very well to two infiltrations; in another case it had no effect. A dancer who had been unable to dance for two months because of a sprained toe-joint was symptom-free after two injections. A tenosynovitis of the flexor carpi radialis which had responded indifferently to deep massage was cured by two infiltrations.

Other Uses.—Quite possibly, hydrocortone will have an important part to play in orthopaedic surgery. Introduced into the knee-joint after—for example, meniscectomy—it should serve to abort the traumatic arthritis and thus shorten convalescence materially. It may prove the treatment of choice in traumatic arthritis at the elbow-joint. Medical uses may include injection into the pleura and pericardium, and perhaps spraying the nasal mucosa in allergic conditions.

Conclusions

Hydrocortone exerts a strong anti-inflammatory action when in contact with fibrous tissue. Lesions of tendon, ligament, and joint-capsule caused by injury or overuse can apparently be cured outright within a week or two. Naturally, the smaller the area of tissue affected the more thoroughly it can be infiltrated. Precise diagnosis by means of the method of selective tension described is therefore an essential preliminary.

Tennis elbow and other tendinous disorders respond particularly well. However, another failure must be recorded in the apparently endless search for the effective treatment for freezing arthritis at the shoulder.

The indications for deep massage by the physiotherapist are narrowed, but those for manipulation remain unaltered.

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Since the Scientific Film Association's *Catalogue of Medical Films* was published in 1952, many more films on medical and allied subjects have been brought to the association's notice, and details of these have been compiled and published as a supplement (Harvey and Blythe, London, price 6s.). Information about some 260 films is given in the supplement, and with the main catalogue short descriptive notes on over 1,200 medical films are now provided. The supplement is intended for use with the 1952 catalogue, in which abbreviations are interpreted and distributors listed. The films cover many aspects of medicine. Most of them have been made in Britain, but some films from the United States of America, Canada, New Zealand, and Russia are also listed. The new films include three on accident prevention, fifteen on health education and health services, several of which are especially suitable for showing to children, and eight on rehabilitation. There are more than twenty on general and specialist surgical subjects, ten on anatomy, several on diseases of the ear, nose, and throat; a large selection on gynaecology and obstetrics, paediatrics, industrial medicine, personal hygiene, and nursing. There are also films on neurology, orthopaedics, pharmacology, psychology and psychiatry, and anaesthetics, and a number on veterinary science.

TECHNIQUE AND VALUE OF AORTOGRAPHY

REPORT OF A CASE OF EXTERNAL ILIAC ARTERIAL GRAFT

BY

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Although aortography was introduced by Dos Santos *et al.* in 1929, it has never been a popular form of investigation in this country, and it is still considered by many to be a difficult and hazardous procedure of no clinical value. Recent developments in vascular surgery, however, have made aortography an absolutely essential investigation in certain cases. It is, in fact, neither difficult nor hazardous, and can be performed under sedation alone. The use of general or high spinal anaesthesia is unnecessary.

Technique

The patient is brought to the *x*-ray room having had, one hour before, "omnopon," ¼ gr. (22 mg.), and scopolamine, 1/150 gr. (0.43 mg.). In the *x*-ray room he is given a test dose of 1 ml. of 70% diodone. This is an important precaution, as, although toxic manifestations are rare, an occasional severe reaction will be encountered. The patient is placed on the *x*-ray table in the prone position and a marker is fixed opposite the spinous process which is judged to be correct. If aortography is being performed to show the iliac vessels the injection is made opposite the third lumbar vertebra. If it is desired to display the renal vessels the injection must be made opposite the first lumbar vertebra or opposite the twelfth dorsal vertebra, to show the coeliac axis and its branches.

A preliminary film is taken. This is viewed and the position of the marker checked before the injection is given. Before proceeding with the injection a dose of intravenous pethidine is administered. This is a most important part in the technique, as it obviates the use of spinal or general anaesthesia. In an average case 100 mg. gives good sedation, but sometimes less is sufficient. A small intradermal weal is raised with 2% lignocaine hydrochloride opposite the selected vertebral spine and 4 to 4½ in. (10 to 11.4 cm.) from the midline. The needle is of S.W.G.16 and 7 in. (18 cm.) in length. It is inserted through the weal and directed towards the vertebral body. If the latter is struck the needle is redirected to pass in front of it. The aorta is easily punctured and at once a strong pulsating flow of blood comes from the needle. It is important to advance the needle a few more millimetres before giving the injection. The needle is connected to the syringe filled with 30 ml. of 70% diodone by an intervening length of about 12 in. (30 cm.) of pressure tubing. In this way the surgeon making the injection stands well clear of the beam of *x* rays. The needle itself is firmly held in 5 in. (12.5 cm.) of soft tissue, and it is unnecessary for the surgeon to steady it with a hand, thereby exposing himself to *x* rays. The injection is given as rapidly as possible and the film exposed as the last few millilitres are going in. If the injection is to be made at the level of D 12 or L 1 it is necessary to direct the needle obliquely upwards, as the twelfth rib prevents its insertion opposite the first lumbar vertebra.

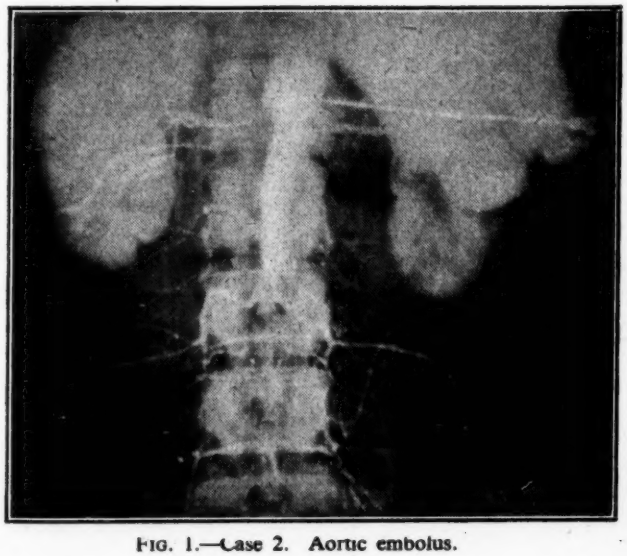

FIG. 1.—Case 2. Aortic embolus.

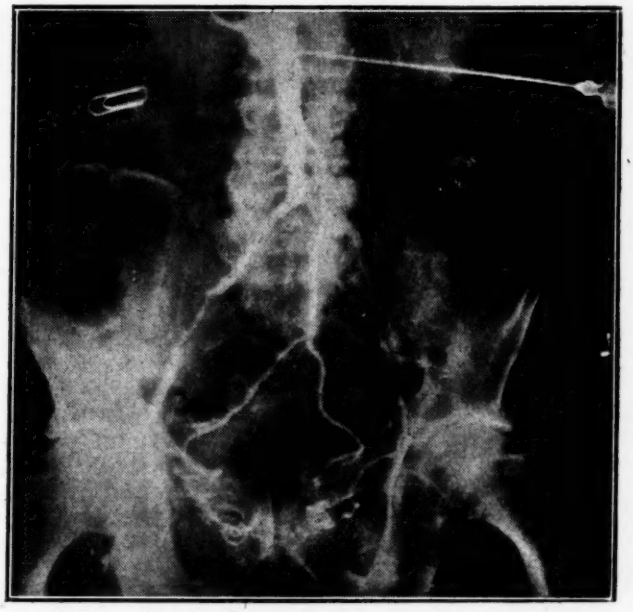

FIG. 2.—Case 3. Extensive atheroma and thrombosis.

We have not encountered any serious ill effect using this technique. On two occasions the needle has been satisfactorily placed at the beginning of the injection but has come out before the injection was completed and a periaortic deposit of dye has been made. This occasions some pain in the back, which passes off readily as the dye is absorbed. Two patients with acute embolic occlusion of the aorta have died within 48 hours of aortography. In each case the site of the needle puncture was difficult to find at necropsy, and no extravasation of blood was seen.

Indications and Results

There are many occasions in which aortography may give extra help in the elucidation of a pathological process, and because it is simple to perform we have used it on a variety of clinical problems. Its greatest value is that it can be used to define exactly the site and extent of a block in the aorta or iliac arteries, the result of embolus or thrombosis.

We have not had a patient with aortic embolus admitted early enough to get a recovery, but the following two examples will illustrate the value of aortography in these cases.

Case 1.—A man aged 56 had complained of anginal pain for five years, but there was no clear history of a recent coronary occlusion. Four weeks before admission he had a sudden loss of power in both legs which lasted only 10 minutes. Two weeks later he went to bed after a sudden attack

FIG. 3.—Case 4. Arrows indicate extent of block in external iliac artery.

of pain in the left calf and a cold foot. He was treated with tolazoline hydrochloride and improved somewhat. Thirty-six hours before admission he developed severe pain in both legs and within six to eight hours sensation was gone. A clinical diagnosis of embolus at the aortic bifurcation was made, but operation was considered inadvisable as the condition had been present for so long. Aortography confirmed the diagnosis and indicated the exact sites of obstruction. These were at the origin of the left common iliac and in the right external iliac. Necropsy confirmed the clinical diagnosis.

Case 2.—A woman aged 42 was known to have had auricular fibrillation and mitral stenosis for some years. She was admitted with a 30-hours history of loss of power and sensation in both legs. The lower limbs were mottled and cold and pulsations were absent. A clinical diagnosis of aortic embolus was made and an aortogram taken (Fig. 1). It was evident that the aorta was blocked at the level of the second lumbar vertebra. In view of the lateness of the condition no treatment was attempted and she died 24 hours later. Necropsy confirmed the site of the block.

It is in the locating of arterial thrombosis above the femoral artery that we have found aortography of greatest practical value. Such an obstruction may give rise to gangrene of the toes or to claudication in the calf, thigh, or buttock. The possibility that these symptoms may be relieved by endarterectomy or by arterial graft makes accurate visualization of the great vessels imperative. In many cases the disease will be shown to be diffuse and probably unsuitable for surgery, as in Case 3.

Case 3.—A man aged 59 was admitted with incipient gangrene of the toes of the right foot. The left leg had been amputated in 1948 for gangrene. Aortography (Fig. 2) showed that the left common iliac artery was obstructed at its origin, and that there was considerable narrowing of the proximal half of the right external iliac artery. The femoral artery is also obstructed just below the profunda femoris branch. The circulation to the legs is largely being maintained by anastomotic branches from the inferior mesenteric.

In Case 4, however, it was possible to excise and graft a thrombosed external iliac artery.

Case 4.—A man aged 64 had severe calf and thigh claudication of one year's duration. He had pain as soon as he took a first step and had to stop after 50 yards. There were no pulses in the left leg. Aortography (Fig. 3) showed this to be due to an obstruction of the whole of the external iliac

FIG. 4.—Case 4. Aortogram taken three months after gratt to external iliac artery.

artery. The artery was exposed extraperitoneally on August 19, 1952, by one of us (R. E. H.). The great vessels were very atheromatous and the external iliac had no pulsation. The affected artery was dissected free, and after application of clamps to the common and internal iliac arteries trial section of the external iliac was begun. It was found to be blocked at its origin and had to be cut from the common iliac, leaving a window in the latter. In sectioning the lower end of the block a small arterial flow was found in the recanalized mural thrombus, but a clear artery was not found until about 1 cm. above the profunda branch of the femoral. A graft consisting of the aorta of a 4-year-old child was inserted by a continuous everting suture. The posterior tibial pulse did not become palpable until some six hours later, when it soon became strong. The patient was seen on November 1, nearly three months after the operation, and had no claudication, and said he could walk anywhere. The pulses are all present in the leg and are of

FIG. 5.—Enlarged spleen demonstrated by aortography. Arrow indicates artery to lower pole of spleen.

good volume. The post-operative aortogram (Fig. 4) shows the graft in position and of normal calibre. There was an excellent flow of blood in the femoral arteries. In October, 1953, 14 months after his operation, he was still getting an excellent functional result and all the peripheral pulses were present.

In addition to its outstanding value in the two types of case which have been described, aortography has occasional value in other circumstances.

In one patient a lump in the left hypochondrium was particularly difficult to feel because of the build of the patient. Serious doubt existed whether the lump was an enlarged kidney or spleen. Aortography clearly demonstrated that it was an enlarged spleen (Fig. 5), for the renal outline was clearly seen and the splenic arteries spread far beyond the confines of a normal spleen. Thus, in general terms, aortography may be of value in diagnosing a doubtful abdominal tumour. It may be of value in locating the site of a suprarenal tumour in a case of Cushing's disease, but we have not yet had the opportunity of testing this. Goodwin *et al.* (1950) record its use in such a case.

Aortography has been added to the more orthodox methods of pyelography in the investigation of kidney disease, as has been fully described by Griffiths (1950). It is claimed that the pooling of dye which occurs in a hypernephroma will distinguish it from a solitary cyst, but we feel that in the absence of such an appearance it would be dangerous to make a definite diagnosis of renal cyst and not submit the patient to an exploratory operation.

Summary

The technique of aortography under sedation without anaesthesia is described and its value is illustrated.

A case in which an external iliac arterial obstruction was accurately located by aortography is reported. The artery was excised and replaced by an arterial graft, with a satisfactory result three months after the operation.

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It is estimated that at the present time out of every 100 average men and women in Great Britain only 2 have naturally perfect teeth; 16 need teeth extracted, 42 require other dental attention, and 40 have complete or partial dentures. These statistics appear in an article contributed to *Progress* by Sir William Kelsey Fry. "Dental disease is one of the consequences of civilization," he says. From examining large numbers of skulls, research workers now know that in the Middle Ages quite half the population had no carious teeth. But by fifty years ago it was unusual to see a patient with a healthy mouth, and during the 1914–18 war large numbers of men were rejected as unfit for active service on account of the state of their teeth. During the last war it was estimated that at 18 years of age 98% of the men and 90% of the women were in need of dental treatment. However, Britain has by no means the worst teeth in the world: some parts of the United States and Norway, Australia, and New Zealand have a much higher caries rate. The incidence of caries in Europe declined in both world wars, and the conclusion is drawn that this was closely linked with the reduction in sugar consumption and changes in bread texture. Nowadays dentists find themselves unable to keep pace with the alarming increase in dental disease. In England and Wales there are 10,000 practising dentists, the majority of whom are over 50 years of age. That means that one dentist is expected to keep between 3,000 and 4,000 people dentally fit.

VALUE OF SINGLE-SAMPLE TEST IN DIFFERENTIAL DIAGNOSIS OF JAUNDICE

BY

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In the differential diagnosis of jaundice, although biochemical tests cannot take precedence over clinical findings, cases occur in which the clinical features are puzzling. For example, chronic hepatitis may in some cases present as painless jaundice simulating obstruction arising from a carcinoma of the head of the pancreas; while in other cases the main complaint may be of pain similar to that of biliary colic. In cases where the clinical picture is problematical, biochemical tests, by suggesting an earlier solution, can be of value, the importance of an early diagnosis being the necessity to decide whether surgical intervention is indicated. On the one hand, the dangers of an unnecessary exploratory operation in a case of hepatogenous jaundice must be avoided, and, on the other, the patient must be guarded from the harmful effects of prolonged extrahepatic obstruction.

The "single-sample tests" have the advantages of simplicity in obtaining the specimen with minimal discomfort to the patient, along with economy in time to the patient and the physician. Coleman (1950) has shown that such tests are reliable, irrespective of the stage of the illness. However, many such single-sample tests recommended (for example, by Schwimmer *et al.*, 1945; Shay and Siplet, 1948; Mawson, 1948; Popper and Steigmann, 1948; and Hoffbauer *et al.*, 1949) involve an imposing number of biochemical determinations, employing a wide range of tests. Bearing in mind that this is a clinical problem as distinct from interesting research, the simpler tests, which can be carried out in any hospital laboratory, must be given prior consideration.

The object of the present investigation was to find out the minimal number of determinations that should be included in a single-sample test to make this of value in differentiating obstructive from hepatogenous jaundice. It is generally agreed that none of the tests employed will estimate the degree of liver damage, and this aspect of the problem is therefore not touched upon. Likewise, no attempt has been made to assess the prognostic significance, if any, of these tests.

Material and Methods

Material.—The present series consisted of 104 patients who showed signs of jaundice and whose records contained sufficient data to establish an undoubted diagnosis. This series was composed of the following:

Obstructive jaundice (67 cases)	
1. Carcinoma obstructing extrahepatic bile ducts	27
2. Calculus in the common bile duct	17
3. Chronic pancreatitis	4
4. Stricture of common bile duct	2
5. Carcinomatosis involving liver	17
Hepatogenous jaundice (37 cases)	
6. Cirrhosis of liver	20
7. Acute hepatitis	11
8. Miscellaneous cases of hepatogenous jaundice	6

Those grouped in "carcinomatosis involving liver" were patients in whom neoplastic metastases invading the liver

were demonstrated either clinically, at operation, or at necropsy, but where no definite extrahepatic biliary obstruction was found. The justification for including such cases among the obstructive groups was that Himsworth (1950) considered that the jaundice in such cases was due to pressure by deposits of growth upon the biliary passages. In the other obstructive groups the diagnosis of obstruction was based on operation or necropsy findings in all but two cases.

As might be expected, in the hepatogenous groups most of the diagnoses were based on clinical findings and progress. Cases in which there was doubt about the diagnosis were excluded from the series. Cases of haemolytic jaundice were also excluded, as this condition rarely presents a problem in the differential diagnosis of jaundice.

Methods.—The tests employed were serum alkaline phosphatase activity (King and Armstrong, 1934); serum total cholesterol (Bloor method as modified by Kenny, 1952); plasma protein; and thymol turbidity (Maclagan, 1944b). These determinations were carried out on a single sample of 20 ml. of venous blood divided into 10 ml. each of clotted and oxalated blood. At the same time a sample of urine was examined for urobilinogen and urobilin.

Results

The individual findings in the 104 patients are not detailed here, but the result of each determination in the patient's initial single-sample test has been classified as indicating obstructive or hepatogenous jaundice according to the criteria in Table I.

Table I.—*Critical Levels*

Test	Obstructive Jaundice	Hepatogenous Jaundice	Reference
Serum alkaline phosphatase	Over 35 units	Under 35 units	Maclagan (1944a)
Serum total cholesterol	Over 300 mg./100 ml.	Under 300 mg./100 ml.	Epstein and Greenspan (1936)
Plasma albumin	Over 3·4 g./100 ml.	Under 3·4 g./100 ml.	Gray (1950)
Plasma globulin	Under 2·9 g./100 ml.	Over 2·9 g./100 ml.	Gray (1950)
Thymol turbidity	Under 4 units	Over 4 units	Maclagan (1944b)
Urobilinogen and urobilin	Not increased	Increased	Watson (1937)

Analysis of the separate tests yielded the results summarized in Table II. The left column under each test contains the number of determinations in each group of patients suggesting an obstructive cause for the jaundice, the numbers in the right column being the determinations suggesting a hepatogenous lesion.

Serum Alkaline Phosphatase.—This was most often raised above the critical level in cases of obstruction due to carcinoma or to metastatic deposits (groups 1 and 5); but even where obstruction rose from other sources it was raised in 16 out of 23 cases (70%). In the present series, however, it was also raised in 10 out of 37 cases (27%) of hepatogenous jaundice. Using 35 units as the differential level, this test by itself would have suggested the cause of the jaundice in 80 out of 104 cases, but would have been misleading in 24 cases. In no case of obstructive jaundice, no matter how mild, was the serum alkaline phosphatase below 20 units.

Serum Total Cholesterol.—In contrast to the above, hypercholesterolaemia was present most frequently where obstruction was due to causes other than malignant neoplasm. It failed to appear in more than half of the cases of obstruction where neoplasm was present, but in many of these cases cachexia, which tends to lower the blood cholesterol, was evident. Although positive in obstructive jaundice less often than the serum alkaline phosphatase, it was misleadingly raised in only three cases of hepatogenous jaundice. The results in Table II show that absence of hypercholesterolaemia need not indicate the absence of obstruction, but where hypercholesterolaemia is present obstruction is probable. Using hypercholesterolaemia as an indication of obstruction, and disregarding a serum total cholesterol of under 300 mg. per 100 ml. as of no differentiating value, this test would have diagnosed correctly only 35 out of 66 cases (53%) of obstructive jaundice, but would have been misleading in only 3 out of 35 cases (9%) of hepatogenous jaundice.

Plasma Albumin.—Hypo-albuminaemia was present in 40% of the cases of hepatogenous jaundice, but was also present in 41% of the obstructive cases. This test was obviously of no differentiating value in the present series.

Plasma Globulin.—Hyperglobulinaemia was present in 81% of the cases of hepatogenous jaundice, but was present also in 81% of the obstructive cases. This test also was obviously of no differentiating value.

Thymol Turbidity Test.—In hepatogenous jaundice this test was more often within normal limits than raised. A normal thymol turbidity is therefore no indication of the absence of liver-cell damage. When abnormally raised, however, it indicated correctly the nature of the jaundice in 16 out of 37 cases (43%) of hepatogenous jaundice, and was misleading in only 7 out of 67 cases (9%) of obstructive jaundice. In obstructive jaundice the level of 9 units was never exceeded in the present series.

Urinary Urobilinogen and Urobilin.—The anticipated absence of urobilinogen and/or urobilin from the urine in cases of obstructive jaundice was shown in 42 out of 62 cases (66%), while in hepatogenous jaundice only 8 out of 36 cases (22%) failed to show either in increased amounts.

Discussion

Serum Alkaline Phosphatase

Although its mechanism is still not clearly understood, this test has repeatedly proved its value since its use in the differential diagnosis of jaundice was described by Roberts (1930, 1933). In the present series there was a similar degree of overlap at the usual differentiating point at 35 units to that reported by Giordano *et al.* (1939), Gutman *et al.* (1940), Higgins *et al.* (1944), and Maclagan (1944a).

The present observation that the rise in serum alkaline phosphatase is most pronounced in the presence of malignant neoplasm has also been noted by Higgins *et al.* (1944),

Table II.—*Analysis of Results*

Group	No. Cases	Serum Alkaline Phosphatase		Serum Total Cholesterol		Plasma Albumin		Plasma Globulin		Thymol Turbidity		Urobilin and/or Urobilinogen	
		35+	35−	300+	300−	3·4+	3·4−	2·9−	2·9+	4−	4+	−	+
1. Carcinoma obstructing ducts	27	22	5	14	13	14	13	5	22	26	1	20	6
2. Calculus in common bile duct	17	11	6	12	5	11	5	1	15	16	1	10	7
3. Chronic pancreatitis ..	4	3	1	3	1	3	1	1	3	4	—	3	—
4. Stricture of common bile duct	2	2	—	—	2	2	—	1	1	1	1	—	2
5. Carcinomatosis involving liver	17	15	2	6	10	8	8	4	12	13	4	9	5
Total obstructive ..	67	53	14	35	31	38	27	12	53	60	7	42	20
6. Cirrhosis of liver	20	8	12	2	17	10	10	2	18	11	9	4	16
7. Acute hepatitis	11	2	9	1	10	9	2	4	7	5	6	4	7
8. Miscellaneous hepatogenous	6	—	6	—	5	3	3	1	5	5	1	—	5
Total hepatogenous ..	37	10	27	3	32	22	15	7	30	21	16	8	28

Schwimmer *et al.* (1945), and Hoffbauer *et al.* (1949). This observation cannot be explained. Cleveland *et al.* (1950) found no detectable phosphatase activity in neoplastic cells in the liver.

In the present series none of the 67 cases of obstructive jaundice showed a serum alkaline phosphatase below 20 units, irrespective of the duration or degree of jaundice. Maclagan (1944a) reported only 3 out of 43 cases of obstructive jaundice as falling below 24 units. It would therefore appear that a serum alkaline phosphatase of under 20 units, in the presence of jaundice, strongly indicates a non-obstructive cause.

Concurrent serum bilirubin determinations with the serum alkaline phosphatase results reported in this paper showed that there was no tendency towards inverse relation with the height of the serum bilirubin in the two groups of jaundice. This is in keeping with the findings of Flood *et al.* (1937), Sherlock (1946), and Mawson (1948). Therefore interpretation of the serum alkaline phosphatase determination should not be influenced by the serum bilirubin level.

Serum Total Cholesterol

The value of this test has been doubted in the past. Sherlock (1946) regarded it as of no value, but her limits for hypercholesterolaemia were low. Hoffbauer *et al.* (1949), using 225 mg. per 100 ml. as the differentiating level, were also not impressed by this test. When, however, their figures are reviewed using 300 mg. per 100 ml. as the point of hypercholesterolaemia it can be seen that only 6 out of their 57 cases (10.5%) of hepatogenous jaundice showed hypercholesterolaemia. This value of 300 mg. per 100 ml. was the level above which Epstein and Greenspan (1936) considered significant hypercholesterolaemia to be present. They found that this level was exceeded by 78% of their cases of obstructive jaundice, while only 10% of their cases of hepatogenous jaundice showed hypercholesterolaemia. The comparable figures in the present series were 53% and 9% respectively. Cantarow and Nelson (1937) recorded that 11 of 28 cases (40%) of obstructive jaundice exceeded 300 mg. per 100 ml., while none of their 22 cases of hepatogenous jaundice showed hypercholesterolaemia. From these figures it would appear that a hypercholesterolaemia of over 300 mg. per 100 ml. is suggestive of obstruction, but that figures below this level are of no diagnostic value.

Determination of the serum total cholesterol is of value not only in confirming the more frequently positive serum alkaline phosphatase test, but also in picking up the case of obstructive jaundice missed, especially in the non-malignant groups, by the phosphatase test. In the present series the cholesterol test indicated the presence of obstruction correctly in six cases in which the phosphatase test had failed.

Estimation of cholesterol esters has been advocated, but, as this estimation is time-consuming and has been shown by Hoffbauer *et al.* (1949) to be of little value, it was not carried out in the present investigation.

Plasma Protein

The present results showed that determination of plasma albumin and globulin is of no differentiating value. This is in accordance with the results and opinion of Schwimmer *et al.* (1945) and Sherlock (1946). There is therefore a clear indication for the omission of these determinations from a single-sample test intended only for the differential diagnosis of jaundice.

Thymol Turbidity

This empirical test, first described by Maclagan (1944a, 1944b), has the advantages of being easy to perform, rapid in giving a result, and clear in its numerical assessment of the reaction. Maizels (1946) considered it to be the most useful of a number of empirical tests compared by him. Watson and Rappaport (1945) believed it to be more uniformly negative in obstructive jaundice than the cephalin-cholesterol test. Franklin *et al.* (1948) found that this test showed statistically the most significant correlation with liver-cell damage.

The test has been criticized for being insufficiently sensitive (Mateer *et al.*, 1947), and this is confirmed by the present results, there being only 16 positive tests in 37 patients (43%) suffering from hepatogenous jaundice. The present results, however, also showed that it was reliable, only 7 misleading results being obtained out of 67 cases (9%) of obstructive jaundice.

None of the 67 cases of obstructive jaundice exceeded 9 units. Maclagan (1947) found none of 56 cases of obstructive jaundice to exceed 8 units; and Hoffbauer *et al.* (1949) found none of 77 cases of obstructive jaundice to exceed 9 units. It would therefore appear that a thymol turbidity of 10 units or over indicates hepatogenous jaundice, irrespective of other findings.

Urinary Urobilinogen and Urobilin

The present findings are similar to those of Cantarow and Nelson (1937). Snell (1947) and Coleman (1950) believed these tests to be of much value. However, as an increase of urinary urobilinogen and urobilin can occur in incomplete obstruction with secondary liver damage, as well as in hepatogenous jaundice, and as absence of both these substances can be found in hepatogenous jaundice at the height of the disease, less reliance can be placed on these urinary tests than on the blood tests. Nevertheless, where the latter are equivocal, the urinary tests may give a hint regarding the cause of the jaundice.

Serial Tests

Repetition of tests has been advocated by many authorities. Although not detailed in the present investigation, 82 tests were carried out on 28 patients. In 22 of these patients the initial biochemical interpretations were subsequently proved to be correct. In five cases with equivocal initial results, subsequent tests altered sufficiently to give a final interpretation later proved correct. In one case, the tests remained equivocal on all three occasions.

Combination of Tests

The present series once again confirms that no single test is absolutely reliable in the differential diagnosis of jaundice. Maclagan (1947), however, combining serum alkaline phosphatase with thymol turbidity results, obtained 68% accuracy. Using the same tests, Hoffbauer *et al.* (1949) had no erroneous results, but their interpretations were equivocal in 30% of cases; and Coleman (1950) found four misleading interpretations in 70 cases. Gutman and Hanger (1941), using serum alkaline phosphatase and cephalin-cholesterol tests in combination, obtained 72% accuracy.

In the present investigation, serum alkaline phosphatase, serum total cholesterol, and thymol turbidity tests have been found to be of most value. The present results have shown the following:

(*a*) Serum alkaline phosphatase
- Under 20 units indicated hepatogenous jaundice
- Under 35 units suggested hepatogenous jaundice
- Over 35 units suggested obstructive jaundice

(*b*) Serum total cholesterol
- Over 300 mg. per 100 ml. suggested obstructive jaundice
- Under 300 mg. per 100 ml.—no value

(*c*) Thymol turbidity test
- Over 10 units indicated hepatogenous jaundice
- Over 4 units suggested hepatogenous jaundice
- Under 4 units—no value

Obstructive jaundice was therefore suggested by either serum alkaline phosphatase over 35 units or serum total cholesterol over 300 mg. per 100 ml., or by both, when thymol turbidity was not more than 4 units.

Hepatogenous jaundice was suggested by: (1) serum alkaline phosphatase under 20 units, irrespective of other results; (2) thymol turbidity of over 10 units, irrespective of other

results; (3) thymol turbidity over 4 units when serum alkaline phosphatase was under 35 units, and serum total cholesterol under 300 mg. per 100 ml.

The results were interpreted as equivocal when: (1) either serum alkaline phosphatase was over 35 units or the serum total cholesterol over 300 mg. per 100 ml., or by both, with thymol turbidity between 4 and 10 units; (2) both serum alkaline phosphatase was between 20 and 35 units and serum total cholesterol was under 300 mg. per 100 ml., with thymol turbidity under 4 units.

Applying these rules to the individual results, this combination of tests can be correlated with the final diagnosis as in Table III.

TABLE III.—*Interpretation of Combined Tests Correlated with Final Clinical Diagnosis*

Group	In Agreement with Diagnosis	Equivocal Interpretations	Erroneous Interpretations
1. Carcinoma—obstructing ducts	22	5	0
2. Calculus in common bile duct	14	3	0
3. Chronic pancreatitis	4	0	0
4. Stricture of bile duct	1	1	0
5. Carcinoma—metastases in liver	11	6	0
6. Cirrhosis of liver	9	6	5
7. Acute hepatitis	8	2	1
8. Miscellaneous cases of hepatogenous jaundice	5	1	0
	74	24	6

Although the present accuracy of 71% shows no significant improvement over the figures obtained by Gutman and Hanger (1941), Maclagan (1947), and Hoffbauer *et al.* (1949), despite the addition of the serum total cholesterol determination to the tests, it is felt that this test is justified, as it correctly indicated obstruction in six cases where the serum alkaline phosphatase had failed, and yet on only one occasion was it misleading by itself. Furthermore, as has been shown in Table II, hypercholesterolaemia is more often present in non-malignant causes of obstruction, the type in which the serum alkaline phosphatase is less often helpful.

When the urinary tests were taken into account in those cases with equivocal blood results, in the obstructive groups 10 out of 15 cases showed absence of both urobilinogen and urobilin, three cases showed a misleading increase of these substances, and in the remaining two cases these tests were not carried out. In the hepatogenous groups, seven cases out of nine showed increase of urobilinogen and urobilin; in two cases neither was increased.

After applying the less accurate urinary tests, the final interpretation of the biochemical tests showed:

In agreement with diagnosis		
Blood tests	74	91
Suggestive urinary tests	17	
Disagreement with diagnosis		
Suggestive urinary tests	5	11
Blood tests	6	
Equivocal (urinary tests not done)		2

The erroneous blood tests were limited to cirrhosis and acute hepatitis, and the proportion to the total number in the series was similar to that reported by Coleman (1950).

Summary

A series of blood tests was investigated regarding the value of these determinations for inclusion in a single sample test for the differential diagnosis of jaundice.

Of the tests employed, the serum alkaline phosphatase activity, serum total cholesterol, and thymol turbidity were found to be of most significance. Determination of the plasma protein fractions was of no value and should be omitted from any single-sample test.

Tests for urobilinogen and urobilin in the urine were found to be of value as supplementary information where the results of the blood tests were equivocal.

Critical levels in the blood tests for the differentiation of hepatogenous from obstructive jaundice are suggested. Applying these criteria in a series of 104 cases of jaundice, the correct diagnosis of the type of jaundice was made in 91 cases. Of the remaining 13 cases, two gave equivocal results, while in 11 the biochemical findings were frankly misleading.

This paper was made possible only through the generosity of Dr. Ian A. Anderson, who gave me free access to the biochemical records of these tests. I cannot adequately express my thanks for his unstinted help and advice. I am also indebted to the physicians and surgeons of the Victoria Infirmary for allowing me the use of their clinical records.

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In his annual report for 1952 the medical officer of health for the County Borough of Smethwick, Dr. Hugh Paul, comments on the rapid decline in infectious diseases, in particular tuberculosis, since the war. He attributes the decline mainly to the use of antibiotics, but, he continues: "On the other hand, one cannot withhold a meed of praise to the conscientious chest physicians throughout this country who have achieved remarkable success during the past two generations. Many of us feared when the regional board took over our schemes in 1948 that the glamour of cure would swamp the infinitely more useful but infinitely less attractive aspects of prevention, and that the tuberculosis service would sink to the level of other branches of hospital cure. We have built better than we knew, however, and it would appear that the tuberculosis officers trained by us in the olden days, soaked in the gospel of prevention from their early days and imbued with the desire to look upon their task in the broadest possible light, are continuing in the olden ways, and have evaded the blandishments of the sirens of curative medicine. One can only hope that the new generation of chest physicians will be trained in the same way, but one cannot help but feel uneasy when one reads advertisements for chest physicians stating that the M.R.C.P. is *necessary* and that previous experience in tuberculosis is desirable. We must not sink to cure."

FLUID CONTENT OF THE NUCLEUS PULPOSUS AS A FACTOR IN THE DISK SYNDROME*

PRELIMINARY REPORT

BY

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The erroneous term "slipped disk," which is often applied to the disk syndrome by the laity, and unfortunately by a large number of their medical advisers, is derived from an impression that trauma is an invariable concomitant of such lesions, yet in a high proportion of cases the onset is insidious. Armstrong (1952) states that approximately 60% of patients with lumbar disk protrusions give a history of injury initiating their symptoms, whilst Eyre-Brooke (1952), in reviewing a series of cases treated by operation, found a similar history in 13.7%. In a series of 121 cases of cervical disk prolapse I have found injury to be a relevant feature in only 9%. As the alleged injury is often trivial in nature, and previous symptoms are often recounted, we must assume that the injury or strain is a precipitating factor only, and therefore that other factors must play a part in the development of the syndrome. It is suggested that one of the many factors is an increase in the water content of the nucleus pulposus.

Göcke (1932) examined the effect of soaking portions of nucleus pulposus in acid, alkaline, and saline solutions, and noted that swelling resulted from the absorption of fluid. Nuclei removed from young subjects took up fluid equal to 95% of their weight when soaked in saline, while those from adult subjects absorbed 50–60% of their weight of fluid, and less than 25% was absorbed by nuclei removed from aged subjects. The increase in weight was greater when nuclei were immersed in alkaline fluid and less when placed in acetic acid. Such a degree of swelling suggests that a similar change within an intact disk would produce a high internal pressure. This prompted the suggestion (Naylor, 1951) that an initial factor in the development of the disk syndrome was a rise of internal pressure due to increase in the fluid content of the nucleus pulposus. The annulus fibrosus would be stretched, producing cervical or low back pain, depending upon the level affected. Should the annulus be thinned, bulging or actual herniation of the nucleus would occur. Once the herniation has appeared mechanical stress would maintain its extrusion. It is possible that the fluid change in the nucleus may be instigated by some endocrine or metabolic factor, and it is probable that the initial change is a depolymerization of the polysaccharide element of the polysaccharide–collagen complex.

Our measurements of the water absorption by the isolated nucleus confirm Göcke's findings, but there seems to be no linear relationship between the amount of fluid absorbed and the ages of the subject. Varying degrees of absorptive power were found in disks from subjects of similar ages. The annulus fibrosus will also absorb fluid, but to a less degree than the nucleus. The addition of hyaluronidase to the immersion fluid increases the weight of fluid absorbed by 20%. This is probably due to the depolymerization of the polysaccharides, causing reduction of size of the particles and increase in the osmotic power of the nucleus.

*Based on a paper read to the British Orthopaedic Association in October, 1952.

Measurement of Pressure Within the Disk

As an initial step a series of experiments was designed to measure the pressure generated within the disk, and an apparatus (see Diagram) was developed for this purpose. The manometer of the apparatus consisted of a glass capillary tube (A) fixed to a 20-gauge serum needle (B) by a brass connector; the joints were sealed with a high-vacuum wax. The needle had a series of slots cut in the distal half-inch to allow an even distribution of pressure to the mercury within the needle and to minimize any blockage. It was bent to 90 degrees at its centre so that it could be inserted horizontally into the disk. A mercury reservoir (C) was connected to another capillary tube (D) fixed parallel to the manometer, the latter being joined to the capillary tube by an inverted U-tube containing alcohol. Alcohol was used in preference to water as it has a smaller surface tension, giving ease of flow and facilitating elimination of air bubbles. Initially the apparatus was filled with mercury, the manometer clipped off, and alcohol then drawn into the inverted U-tube. The clip (E) was then opened, the manometer needle being immersed in mercury. By alternately raising and lowering the reservoir a column of mercury is drawn into the manometer. The clip (E) was then closed and the apparatus was ready for use.

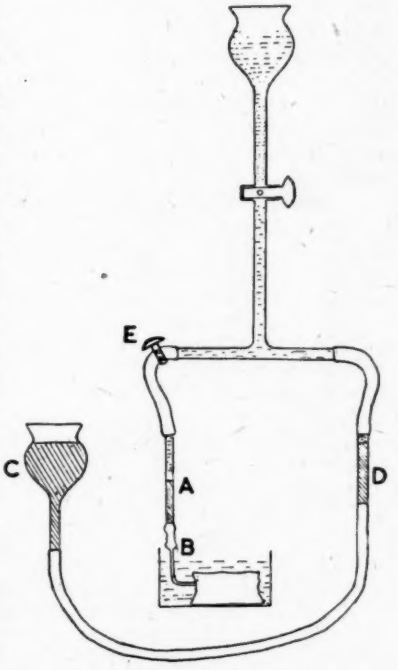

Diagram of apparatus.

Fresh lumbar disks from necropsy subjects were obtained with a thin sliver of bone on each side, this being important to prevent any force being expended on producing bulging of the nucleus. The disk under test was pierced by a hollow needle of the same gauge as that in the apparatus, and the manometer needle was then inserted along the track made. This minimized the risk of blockage by tissue. The specimen was then placed in a glass crystallizing dish and the screw clip (E) opened. The mercury in the reservoir and side tube was levelled and a travelling microscope focused upon the meniscus of the manometer and its scale read, the pressure then being equal to that of the atmosphere. The disk was then immersed in fluid, using water or normal saline. To note the pressure developed, the mercury reservoir was adjusted to bring the meniscus in the manometer to its initial level. The height of the reservoir above the level of the disk is then the pressure required to neutralize that developed within the disk. Initially 20 disks have been investigated in this manner.

Results

Three experiments were valueless, as blockage of the needle occurred and no readings could be obtained. Of the remaining 17, 11 developed a high, measurable internal pressure, whilst one developed enough pressure to rupture the bone end-plate, and no internal pressure was therefore measured. This disk had been cut with a very thin end-plate, and a complete transverse fracture of this developed, with protrusion of the swollen nuclear material. Simultaneously a disk from the same subject developed a pressure of over 80.2 cm. Hg. It was impossible to raise the mercury reservoir high enough to depress the mercury in the manometer to its normal level, and if the movements of reservoir and manometer meniscus are proportional then a pressure of approximately three atmospheres had developed.

The most significant result obtained was the spontaneous rupture of the annulus fibrosus in one specimen, which developed after 17 hours' immersion in water to which hyaluronidase had been added. At the time of rupture a pressure of 20 cm. Hg was measured, but, despite the production of the rupture, the internal pressure had increased to 80 cm. after eight hours' immersion. The disk bulged extensively, and, on section, the rupture of the annulus and herniation of the nucleus were easily demonstrated.

Two disks from very old subjects registered no rise of pressure, the nuclei being small, brown, and dry on section. Evidently no fluid had been absorbed, and this can be explained by the operation of two factors : (*a*) decreased permeation as a result of sclerosis of the end-plate ; and (*b*) loss of polysaccharide, which occurs with advancing years.

There is little doubt that a large contribution is made by the latter factor. The absence of water absorption and change of internal pressure in disks of aged subjects is consistent with the known decreased incidence of disk prolapse in that age group. If the polysaccharide content of the nucleus is very much reduced, then fluid absorption, and therefore increase of internal pressure, will be minimal or absent and the potentiality of disk herniation reduced. Sylven (1951), using metachromatic staining methods, showed that the mucoid element in the nucleus was reduced with advancing degeneration. During the course of *x*-ray diffraction studies of intervertebral disks we have obtained confirmatory evidence of this (Happey, McRae, and Naylor, 1953). *In vivo*, where there is a compression force due to the superimposed body weight, a smaller absorption of fluid would lead to the development of considerable internal pressure.

A compression force was applied to disks, placed in the apparatus previously described, by means of a flat steel bar, weights being added to its ends. With the dry disk a gradual addition of weight was accompanied by a rise of internal pressure, except in those which showed advanced degeneration. The latter had lost their elasticity, and compression caused no rise of internal pressure, while subsequent immersion during maintenance of pressure was without effect. In contrast, a disk from a subject aged 35, compressed by a load of 24 kg., showed a rise of internal pressure from 47 to 119 cm. after immersion in water. Preliminary experiments in which absorption from one or both end-plates is blocked suggested that the fluid reached the nuclei by permeation through the end-plate.

Discussion

The preliminary experiments show that a high pressure can be developed within an intervertebral disk by absorption of fluid, this most probably entering through the bony end-plate. It is postulated that the possible sequence of changes leading to the development of the disk syndrome consists of : (1) depolymerization of the polysaccharides of the collagen–polysaccharide complex in the nucleus pulposus, leading to (2) increased power of water absorption, causing (3) absorption of fluid by the nucleus, the fluid entering via the end-plate ; (4) increase of pressure within the disk. The forces developed by leverage and muscular action would augment this.

It is possible that a return to the *status quo* by a process of polymerization does not occur, but that the internal pressure falls to normal as the depolymerized molecules are absorbed. This process can be repeated with each episode of symptoms, and would explain the gradual development of degenerative change in such disks. A stage is ultimately reached when the disk has degenerated to such an extent—and thereby lost its water absorption power—that prolapse cannot occur. It is possible that a similar process in multiple disks produces attacks of "fibrositis."

Further and more extensive experiments are being conducted to investigate this hypothesis, using modified apparatus to measure the high pressure generated within the disk.

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Medical Memorandum

Thyrotoxicosis Complicated by Thrombocytopenic Purpura

The association of thrombocytopenic purpura with a toxic goitre is rare. The literature reveals approximately twelve such cases (six female and six male). In several the clinical picture may have been complicated by the administration of myelotoxic drugs (Jackson, 1931 ; Corson, 1942 ; Fewell *et al.*, 1950 ; Hart, 1951). In the remainder no such complicating factor is evident (Finochietto *et al.*, 1936 ; Lavastine and Cachin, 1940 ; Woodruff, 1940 ; Bomford and Rhoads, 1941 ; Bicknel and Dicker, 1942 ; Conklin and Shank, 1944 ; Roberts, 1948). In the following case associated drugs, such as bismuth, "sedormid," or thiouracil, were not given before the occurrence of the purpura. The purpuric manifestations were associated with the thyrotoxicosis before treatment. Propylthiouracil was administered pre-operatively after the combination of the two diseases had been noted.

Case Report

A woman aged 62 was admitted to hospital on September 5, 1951. She had been breathless on exertion for years, but this had been aggravated after a three-weeks period in bed for generalized joint pains in January, 1951. Ten days before admission a slight cough and a mild tonsillitis developed. A small haemoptysis occurred with the onset of the cough. Blood had been passed per rectum, and a widespread purpuric rash had developed over the body and limbs and in the mouth. She had bruised very easily and had lost weight over the past year. A mild degree of ankle oedema had been present for years. She had had a right-sided pneumonia with pleurisy forty years before, and several attacks of tonsillitis since. There was no history of rheumatic fever and no relevant family history.

Physical examination revealed a cachectic-looking patient who was dyspnoeic. The mucous membranes were pale, the teeth were decayed, and a mild bilateral tonsillitis was evident. Tremor was marked. The hands were warm and moist. The thyroid gland showed a generalized enlargement of both lobes. Multiple purpuric spots were apparent all over the body and on the gums and tongue. Pulse rate 90. Rhythm regular. The apex beat was displaced laterally. On auscultation the grade II apical systolic murmur was heard and crepitations were present at the bases of both lungs. There was a mild degree of ankle oedema. The liver

was enlarged and the spleen was easily felt. The blood pressure was 160/75. The haemoglobin was 29%, red cells 2,000,000 per c.mm.; the white-cell and differential counts were normal. No platelets could be seen. The bleeding-time was 14 minutes, clotting time 5 minutes, and prothrombin time 94% of normal.

On the day after admission more blood was passed per rectum, and her condition was deteriorating; she was therefore transfused with 4 pints (2.3 litres) of blood, with much improvement. The haemoglobin rose to 50%, and a platelet count six days after admission was 180,000 per c.mm. A marrow biopsy was normal; the leucocyte: erythrocyte ratio was 6:1; megakaryocytes, normal in number, showed no obvious morphological abnormality.

A week later her condition deteriorated. New petechiae appeared over the trunk. The bleeding-time had risen to 20 minutes, and the platelets had fallen to 70,000 per c.mm. and the haemoglobin was 54%. During the next week her condition fluctuated, with a tendency to improve. From the twenty-fifth day until discharge, 36 days after admission, progress was maintained, the haemoglobin rising to 76%, and the platelet count to 186,000 per c.mm.

A culture from the throat revealed no pathogenic organisms. Thyroid metabolism, estimated by radio-active iodine tests, showed results which were consistent with a moderate thyrotoxicosis. Blood cholesterol was 121 mg. per 100 ml. An electrocardiogram showed the pattern of left ventricular strain. A skiagram of the chest revealed signs of old tuberculous infiltration at the right apex. Liver-function tests were all normal. Propylthiouracil therapy was started twelve days after admission, in doses of 50 mg. three times a day. In addition penicillin was given for the tonsillitis, with iron and vitamins for the anaemia.

When seen in the out-patient department on November 1 she was still showing signs of early heart failure, and there had been a recurrence of the purpura. She was still taking propylthiouracil.

She was readmitted to hospital on November 5, showing very much the same clinical picture as before, but to a less degree. She was dyspnoeic and pale. The thyroid gland was more enlarged than previously. The hands were moist and tremor was marked. There was widespread purpura, especially on the legs. The haemoglobin was 62%, with 4,000,000 red cells per c.mm. The white-cell and differential counts were normal. The platelet count was 165,000 per c.mm. The blood cholesterol had risen to 160 mg. per 100 ml. Partial thyroidectomy was decided upon to control the thyrotoxicosis. The petechiae gradually cleared, and, apart from an epistaxis and a small subconjunctival haemorrhage into the left eye, the patient was relatively well. Propylthiouracil therapy was continued up to the time of operation, the dose having been doubled.

A partial thyroidectomy carried out one month after the second admission was uneventful. She had a mild pyrexia for four days after this. A little extra bruising of the neck occurred around the wound, but there was no fresh attack of purpura. Auricular fibrillation supervened for four days after the operation, normal rhythm then being resumed without treatment. The thyroid gland, which was large and fleshy, showed, on section, changes characteristic of toxic adenoma, modified by thiouracil.

The patient was discharged from hospital forty days after her second admission. The haemoglobin was then 86%, and the platelet count 170,000 per c.mm. She had gained 9 lb. (4.1 kg.) during the second admission period and looked fit and well.

COMMENT

The association of thrombocytopenic purpura with certain endocrine disturbances is not uncommon. Numerous authors have reported this association with pregnancy. Minot (1936) and Pohle (1939) showed that thrombocytopenic purpura may occur in certain phases of the menstrual cycle. In the above case thrombocytopenic purpura complicated thyrotoxicosis, and there is no suggestion in the history of any other intoxication, such as from myelotoxic drugs. So far as can be ascertained, the thyrotoxicosis preceded the purpura. The incidence of the combined diseases seems to be about equal between male and female. No case has occurred below the age of 28. Probably the total number of cases reported of the combined diseases, without any complicating factor, is less than ten. Wintrobe (1946) believes that there is no adequate reason to assume that the combination represents more than the coincidence of two unrelated diseases. The paucity of cases lends some support to this opinion. On the other hand, Woodruff (1940) takes the opposite point of view, and believes that the leucocytes and platelets are specifically affected by the thyrotoxic state. He believes that the degree of toxaemia produced may either stimulate or depress the number of platelets, according to the mildness or severity of the degree of toxaemia.

In a discussion on the cause of idiopathic thrombocytopenic purpura, Robson (1949) suggests that the spleen and other reticulo-endothelial tissues produce some factor which alters the state of the capillaries and reduces platelet formation from megakaryocytes. Such might be the case here. It does seem possible that the state of capillaries was a more important factor than the thrombocytopenia, on re-admission, when purpura was still evident with a platelet count of 165,000 per c.mm. It seems reasonable to suppose that the activity of the spleen might be reduced with the reduction of lymphatic hyperplasia which occurs after thyroidectomy. It was felt after readmission that partial thyroidectomy was necessary in this instance. Propylthiouracil, while having some effect on the thyrotoxic state, did not seem to benefit the purpuric manifestations. In view of the case reported by Fewell *et al.* (1950), in which purpura followed propylthiouracil therapy, it seems wiser not to use this drug when the two diseases are combined. It is suggested that operation is preferable to drug therapy when thrombocytopenic purpura and thyrotoxicosis co-exist.

Our thanks are due to Dr. Kenneth Robertson for permission to publish this case, and to Mr. L. A. Richardson, who carried out the partial thyroidectomy. We would also like to thank the laboratory for the haematological investigations, and the radiotherapeutic department for the radioactive iodine tests.

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The new radiological department of the Clatterbridge Hospital, Bebington, Cheshire, was officially opened on October 2 by Dr. Peter Kerley. The department is entirely self-contained and has been planned to give direct access to the operating theatre and easy communication with the wards. It is divided into three main sections for general and fluoroscopic work, pulmonary, cardiac, and gastro-intestinal examinations, and for genito-urinary investigations.

Reviews

GASTRO-INTESTINAL RADIOLOGY

Gastrointestinal X-ray Diagnosis. By Max Ritvo, M.D., and I. A. Shauffer, M.D. (Pp. 838; 470 illustrations, with two in colour. £7 10s.) London: Henry Kimpton. 1952.

Drs. Max Ritvo and I. A. Shauffer have written an important book intended mainly for the radiologist and gastro-enterologist. After an introductory section of twenty-six pages the whole of the alimentary tract is considered seriatim from pharynx to rectum. Sections follow on the gall-bladder and liver, the pancreas, spleen and abdomen, and abdominal herniae. The scope of the book is wide. The authors have omitted very few lesions of the alimentary tract that are susceptible to *x*-ray demonstration. The pattern of the work is admirable from the radiologist's point of view, since in the description of each lesion of any importance the authors include an account of the aetiology, pathology, and clinical signs and symptoms in addition to the *x*-ray manifestations.

It is inevitable that the reviewer will find in any work like this some matters with which he is at variance, and in this one there are a few. The technique of examination of duodenal ulcer is not described in sufficient detail to be informative and some of the complications following gastric operations are not mentioned. The modern views on the causation of hiatus hernia do not appear : it seems that the authors regard most of these hernias as congenital. The views expressed on chronic appendicitis lack clarity. Various *x*-ray signs of chronic appendicitis are described, but whether or not there is such a pathological entity is left in the air.

These criticisms of detail are small in the perspective of the work as a whole, which is outstandingly good. It is a compendium of information, readable, beautifully produced, and abounding in well-chosen illustrations. In spite of the price, which, as of most American books nowadays, is high, it is a book warmly to be commended to all who are engaged or interested in gastro-intestinal radiology. It is a credit to the great school in Boston from which it comes, and the authors are to be congratulated on an outstanding work.

S. Cochrane Shanks.

EAR DISEASE

Lehrbuch der Ohrenheilkunde. By Dr. E. Lüscher. (Pp. 414; 246 figures. £3 6s. 6d.) Vienna: Springer-Verlag. 1952.

In his preface the author refers to the important advances in treatment by the systematic use of sulphonamides and antibiotics, in the new approach to the physiology of hearing by the extended use of electro-acoustic apparatus, fresh methods of vestibular investigation, and the important operation on non-inflammatory diseases of the ear—all developed during the last decade—and he considers that these facts call for this up-to-date book. Professor Lüscher has certainly justified his opinion, and it is striking that he has carried through this exacting task without calling on colleagues except to write on audiometry; here he has the assistance of the head of the acoustic laboratory, Dr. Zwislocki.

The book is arranged on conventional lines. Chapters on the anatomy and physiology of the ear are followed by a detailed description of the methods of examining the ear and tympanic membrane and of the testing of hearing and vestibular function—all fully illustrated. The student will find the early tests simple to follow, but the modern audiometric tests and their application are more suited to the expert. Audiometry is discussed very fully. The audiometer used and illustrated is that designed by Zwislocki and made at Basle. Tuning-fork tests and their results are compared with audiograms, intelligibility *versus* intensity being illustrated by good diagrams. The author's "ear-microscope" allows a ten-fold enlargement of the view of the tympanic membrane to be obtained and coloured photographs to be taken. It is of great interest, and the reproductions of normal and abnormal conditions are lavishly scattered through the text. Such magnified views are so unusual that their interpretation requires practice. The use, too, of Dishoeck's "pneumophon" to investigate the function of the Eustachian tube is explained.

For the treatment of acute otitis media the author advises sulphonamides in the first place, and then penicillin unless an alternative is indicated by the organism found in the ear discharge; when paracentesis is required the incision is to be made from above downwards instead of from below upwards as recommended in English books. The simple mastoid operation is described but not illustrated. Chronic suppurative otitis media is divided into two classes—with and without cholesteatoma—and the author describes the radical operation and discusses the endaural and postaural approaches. Complications are treated in the usual way, and their pathology is admirably explained with excellent microscopical slides. For treating cerebral abscess the author advises an approach through a radical mastoid operation, though the neurosurgical approach is subsequently mentioned. It is interesting to find positional vertigo and nystagmus with their possible causes discussed. Ménière's disease and treatment are fully described. Vitamin B_1 has been found of considerable value.

This book is of such a high scientific standard that it would appear to be more suited to experts than students. Separate chapters on important subjects would make for easier reading and reference. The author gives evidence of world-wide reading, and quotes from Continental, American, and British authors, but it is unfortunate that he gives no references for readers who might wish to study the original papers. The specialist will find lucid descriptions of the science of audiology and modern work with the speech audiometer, together with the means of determining the site of the lesion causing deafness. The author fully discusses otosclerosis in relation to the fenestration operation, the choice of cases, prospective improvement, and complications. He describes the operation in detail but shows only two pictures, both Lempert's. There is one excellent photomicrograph depicting the results of a successful operation three and a half years previously. A special feature is the number and quality of the illustrations, many of them coloured, illustrating clinical conditions. These are in addition to the numerous coloured pictures of the tympanic membrane, of which all are good; perhaps those of exudative otitis media and rupture of the membrane stand out. The work will surely have a wide circulation among readers of German.

W. M. Mollison.

SURGICAL EXPOSURES

An Atlas of Surgical Exposures of the Extremities. By Sam W. Banks, M.D., and Harold Laufman, M.D., Ph.D. (Pp. 391; 552 illustrations, on 179 plates. £3 15s.) Philadelphia and London: W. B. Saunders Company. 1953.

A sound knowledge of anatomy is a necessity for a good surgeon. That is why the aspirant to the higher surgical diplomas must demonstrate to the examiners that he possesses such knowledge. A surgeon in active practice should have constantly in mind the normal anatomy of the part on which he is operating and ought seldom to need a series of pictures to show him how to approach the various aspects of the limbs. But memory is often fallacious, and surgeons sometimes find it difficult to keep up their anatomy, and some doctors whose anatomy is very rusty may, in a case of emergency, have to operate. For such this sumptuous book will be helpful.

The atlas consists of 179 pictorial plates on each of which are three or four illustrations of the structures met with in exposing various parts of one or other extremity. It is designed "to serve the student and resident in surgery . . . and to be a timely refresher to the experienced surgeon who operates on the extremities only occasionally."

The illustrations were all specially prepared and were based on photographs of actual dissections of the cadaver, so that the "final drawing is in every case a faithful representation of the anatomical findings encountered at surgery." This must have entailed an enormous amount of work, and the authors are to be congratulated on the successful result.

But a word of caution must be sounded. Every senior surgeon knows, and the junior surgeon will soon learn, that in many if not in most instances the parts seen at operation are seriously altered by disease or trauma, and the normal appearances depicted in this book will appear distorted and sometimes almost unrecognizable. Moreover, in dealing with malignant tumours one may have to discard all set incisions in order to cut clear of the growth. The pictures here will no doubt help many a novice and may give many a useful suggestion to the experienced surgeon. It would be a good plan if at least some of the main exposures could have been printed in colour, though no doubt that would have added greatly to the expense.

ZACHARY COPE.

STAMMERING

Understanding Stuttering. By A. B. Gottlober, A.B., Ph.D. (Pp. 274. $5.50.) New York: Grune and Stratton. 1953.

This book is intended primarily for stammerers—or stutterers, the designation preferred in the United States—and their parents, relatives, and friends, in the hope of assisting the patient who would otherwise receive no understanding or help. Nevertheless, all who are concerned with speech therapy will derive much benefit from perusing it, although one can scarcely agree with the author that the term "blocking" is preferable to "stammering" or "stuttering"; in fact, to find a stammerer continually referred to as a "blocker" becomes somewhat irksome.

After a simple outline of the physiological mechanism of speech, Dr. Gottlober gives a very good description of the various problems of personality associated with stammering. This is probably the most valuable part of the book, especially the observations on the upbringing of children of so-called nervous temperament. He gives some sound advice on preventive measures in psychoneurotic reactions, not only in relation to speech disorders but also in general circumstances.

As regards treatment, the author postulates four main therapeutic procedures: (1) the education of the patient to the understanding of his disorders; (2) reconditioning, by which he means the production of new speech patterns to replace the former and undesirable patterns, with the object of enabling the muscles concerned with speech to function more smoothly; (3) relaxation, both physical and mental, to reduce emotional tension; and (4) psychotherapy, both individual and group. This aims at uncovering the original and underlying causes of the speech disorder and any possible factors aggravating or sustaining the abnormal condition. While most of the methods described are advantageous for application to adult and adolescent patients, some are scarcely suitable for young children.

Certain of the author's views on the aetiology of stammering might not meet with general acceptance. But on the whole the debatable matters in the work are few, and Dr. Gottlober has made a valuable contribution to that difficult problem—the treatment of stammering.

C. WORSTER-DROUGHT.

CARDIAC ARRHYTHMIAS

Extrasystoles and Allied Arrhythmias. By David Scherf, M.D., F.A.C.P., and Adolf Schott, M.D.(Heidelberg), M.R.C.S. (Pp. 531; 212 figures. £5 5s.) London: William Heinemann. 1953.

This book is a most comprehensive treatise on a subject that has slipped quietly into the background nowadays. Thirty years ago the riddles of these disorders of rhythm were still the main object of interest for doctors using the electrocardiograph. But although their importance has hardly much share of the limelight in these times, and has rather diminished in consequence, there is still a great deal that we do not know about them. Not infrequently one may wonder whether they do not require more attention. This book supplies everything that can be asked for at present. The opening historical chapter is very well done; the older accounts and conclusions are interesting to read. How that genius Morgagni, as usual, has often the first (and last) word to say on the subject!

In a long chapter the authors discuss the various types of extrasystole. They classify them by their site of origin as shown by the electrocardiogram and also by other signs. The authors conclude that extrasystoles which show varying forms in the electrocardiogram, and so are presumably from different foci, indicate myocardial disease.

There is a full description of the theory of parasystole; digitalis and infection are held to be the causes. A chapter is devoted to alternation of the pulse; flutter, fibrillation, and paroxysmal tachycardia are included, for the authors consider that the mechanism underlying these arrhythmias is akin to ectopic beats, particularly the auricular. It is satisfactory to see these discussed again in relation to modern knowledge. The physiological aspects of extrasystoles are fully considered.

The authors' style is clear and concise and free from jargon. The illustrations for the most part are very good, but some are dim and blurred. Usually the standard leads and one or two chest leads are shown. There is a summary at the end of each chapter, but sometimes it is disappointing and merely indicates what has been mentioned. There are full references. This is an admirable work; the clinical aspects are fully discussed; the opinions and judgments are sound. All cardiologists will want to have this book on their shelves and will often refer to it. It is much more than an academic study.

TERENCE EAST.

A PATIENT'S DRAWINGS

Schöpferische Gestaltung aus dem Unbewussten: Ein analytisches Bilderbuch. By Dr. M. Schultze-Niemann. (Pp. 45; 26 figures. M. 12.) Munich: J. F. Lehmanns Verlag. 1953.

Psychotherapeutic schools have searched hopefully, though with little success, to find standard procedures of treatment which could be applied with benefit by any trained and intelligent technician. But success in psychotherapy seems to require a personality endowed with intuitive and aesthetic gifts, so that the subtle play of unconscious motivations can be readily divined and appreciated. Psychotherapeutic practice has remained an art which has had a special appeal for artistically sensitive persons. It is no wonder therefore that there has been a recurrent tendency for therapeutic art to change into art therapy, affording pleasure to both patient and doctor.

In this book the author has attempted to share with a wider public the pleasure she derived from a course of psychotherapy which relied largely on the interpretation of drawings and paintings a patient had been encouraged to produce. There is no doubt that the author has been successful in her endeavour, for the book provides excellent reproduction of thirty-two pictures and an imaginative analysis of them in the text. The author wisely makes no claim about the particular therapeutic virtue or superiority of this form of treatment. The patient, a 29-year-old single woman, suffered from depressive symptoms following upon the death of her father. She recovered after nine months of treatment, having painted fifty-two pictures. Psychotherapy continued for another fifteen months and a total production of 300 paintings.

In her theoretical introduction the author refers mainly to the work of J. H. Schultz (the author of "autogenous training" as a psychotherapeutic method), who writes a foreword, and to K. Schultze-Jahde, who provides a theoretical framework couched in unattractive German neologisms. But the book can be enjoyed without this theoretical encumbrance, which is not an essential part of it.

F. K. TAYLOR.

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FAMILY DOCTORS AND PUBLIC HEALTH

The general practitioner of forty years ago was as well equipped as anyone else to deal with the social consequences of ill-health. But times have changed, and, though personality and integrity are as important as ever, medicine is no longer confined to bedside therapeutics and such amelioration as wise counsel brings. The public in a Welfare State expect, and indeed have a right to, what is now often called social therapeutics, and the wise family doctor will accept all the aid which his colleagues in the health departments of local authorities can give him. The growth of the hospital service has shown the need for many auxiliaries—physiotherapists, occupational therapists, almoners, and others—to assist the consultant. Similarly, in general practice the local health authority through its medical officer of health is required to provide the general practitioner with his helpers—midwives, home nurses, health visitors, domestic helps, and so on. The General Practice Review Committee in its recently published report[1] concluded that there was no need for an atmosphere of competition to persist between general practitioners and public health departments. And on another page in this issue Dr. J. S. Thomas, himself a general practitioner, in making a forceful plea for bringing the health visitor into the family-doctor team, emphasizes the fundamental change which the N.H.S. Act, by providing a full medical service for the whole population, has made in the orientation of the local authority services. Dr. Stephen Hadfield, in his field survey of general practice,[2] noted good relations with the public health service when the general practitioner was doing part-time work in a clinic—a finding only to be expected, for in this way the general practitioner can obtain a much better insight into the purposes behind the work of the health department.

In the past the medical officer of health was always requesting information from general practitioners—who often did not see the point of the inquiries because their training in the principles of preventive medicine had been inadequate—but now he is in the happier position of providing some assistance. The district nurse, or home nurse, now employed by the local health authority, is an accepted and welcome helper to the general practitioner. The relationship with the midwife is not always so happy, but in very few areas is there a co-ordinated scheme of midwifery where the responsibilities of the hospital, the general practitioner, the midwife, and the local authority clinics are integrated into a well-knit scheme. There is need for a frank discussion among all concerned to achieve this desirable end. The domestic help service, although not free of charge, is accepted as an important contribution to the stability of a household in sickness, disability, or during childbirth. This is a new service for the local health authority to administer, and not all doctors are yet conversant with its working, though the medical officer of health is always willing to explain.

The newest recruit to the growing army of those who can help the general practitioner in his work is that sometimes controversial figure the health visitor. Even to-day it comes as a surprise to some doctors to learn that she is a State-registered nurse, a midwife, and also trained in social medicine. She came into the scheme of things primarily as a health educator with special responsibility towards the mother and child. Her success in this field has, despite the difficulties, been great. Under the National Health Service Act the scope of her work has been widened, and this is not always appreciated even by the health visitor herself. Elsewhere in this issue we reprint the paper read at this year's Annual Meeting by Dr. Llywelyn Roberts on the subject of the health visitor and the family doctor, and in this he not only makes plain the scope of the routine work of the health visitor but he also enumerates the ways in which she can help the G.P. Essentially a field worker, she can assist the family doctor in the care of the mother and child in seeing that his instructions on infant feeding and care are carried out, and she can also help him to supervise the welfare of the aged, the disabled, and the tuberculous in their homes.

Dr. Hadfield found that 28% of the general practitioners he questioned complained bitterly about the activities of health visitors. Some medical officers of health, convinced in their own minds that health visitors are the backbone of the public health service, take the view that those who remain hostile to the work of health visitors can be ignored as reactionaries. But such a view overlooks what has been, and often still is, a serious fault in the organization of a public health department. The ignorance of some general practitioners may be lamentable, but how often is it due to the failure of the M.O.H. to enlighten his colleagues in general

[1] *British Medical Journal Supplement*, 1953, **2**, 131.
[2] *British Medical Journal*, 1953, **2**, 683.

practice about the purpose of the work of health visitors? The Hadfield report should stimulate medical officers of health to make much greater efforts to explain the work of health visitors to the general practitioners in their areas and to impress on health visitors the fact that their work loses much of its point if they have not succeeded in obtaining the good will of general practitioners.

The success or otherwise of the health visitor will depend more and more on a satisfactory working arrangement being established between her and the general practitioner, so that she is working with him and for him in essentially the same way as the district nurse now does. She is employed by the local health authority, but should be able to work directly for the family doctor. During the discussion which followed the reading of the papers by Drs. Roberts and Thomas at Cardiff last July, Dr. Mary Esslemont made a plea for direct contact between general practitioners and health visitors, preferably by telephone, and it is good to learn that in some parts of the country medical officers of health are doing all they can to encourage general practitioners to ring up the health visitor when they feel her experience can be helpful. Many successful schemes of co-operation are in being, not only between health visitors and general practitioners, but also between health visitors and hospitals. In Cambridge, for example, the consultant and almoner in the hospital, the family doctor, the home nurse, the health visitor, and the home help all work together in arranging for the patient's early return home from hospital. Undoubtedly, much more could be done on these lines to increase the availability of hospital beds.

There are many outstanding problems affecting the general practitioner and the health department yet to be solved. Little has been done in the home care of the mentally ill patient, whose illness is often conditioned by environment, which can sometimes be influenced. Housing is one of these environmental factors, and the medical officer of health is often asked to assist. Rehousing is difficult during the present shortage of houses, but is made easier if undertaken in co-operation with the medical officer of health and the general practitioner. There are a number of other important aspects of general practice where team-work is essential. The field of health education has not been fully explored. It offers great possibilities, and is essentially one for co-operative effort. Similarly prevention, at one time restricted to the sphere of infectious diseases and the prerogative of the medical officer of health, is now a much wider matter embracing many fields of medicine; moreover, it holds out some possibility of reducing the high cost of the medical services, apart from the alleviation of suffering. Associated with the study of prevention is the wider subject of research and local investigations into ill-health—and here again co-operation between the medical officer and the practitioner could be fruitful and interesting.

But co-operation is not something that can be made to order. The cleavage between various branches of the services has unfortunately been too deep and lasted too long. Co-operation springs from mutual understanding and confidence. It must grow gradually, and should not be forced on unwilling participants. Greater co-operation is inevitable, for the advantages are too great for it to fail. Both branches would do well to forget their past disagreements and with an open mind find out the best in each other for their mutual benefit and for the sake of the patient.

FORCEPS DELIVERY

The evolution of obstetrics is largely governed by two sets of factors—those which derive from progress in medicine in general, and those which follow advances in knowledge, refinements in technique, and extensions in facilities specific to midwifery. In his paper delivered at the Annual Meeting of the B.M.A. in Cardiff in July this year and printed in this issue of the *Journal*, Professor T. N. A. Jeffcoate describes how over the last 25 years these two groups of factors have effected a striking fall in maternal and foetal mortality and morbidity, and how in particular they have caused us to review the place of forceps in present-day obstetrics. He points out that in hospital practice the forceps delivery rate has almost trebled during the last quarter-century, an increase obtained at the expense of spontaneous deliveries, not of caesarean sections; indeed, section has largely replaced the difficult mid-forceps operation. This increasing use of forceps cannot be condemned as meddlesome midwifery, for it has been attended by a considerable reduction in risk to mother and baby. It is not surprising, therefore, that the discussion at Cardiff revealed that the forceps rate was as high or even higher in private practice. As Professor Jeffcoate puts it pithily, "Babies previously born dead with forceps are now being delivered alive by caesarean section, while those stillborn as a result of spontaneous delivery are now extracted alive with forceps."

The improved results of forceps delivery are due partly to improvements in technique and partly to a change in our ideas on the indications for forceps. Technically, for example, the accurate cephalic application of the blades reduces the risks to the foetus, while the use of local analgesia increases the margin

of safety for the mother. As to the indications for forceps, the keynote has become intelligent anticipation of the traditional indications, reinforced by the belief that the duration of the second stage of labour can be allowed to exceed two hours only to the detriment of the mother and baby. This freer conception of the indications applies in large measure only to hospital practice, where there are adequate facilities for treating any unexpected complication. In domiciliary practice, where the careful antenatal selection of patients for confinement in hospital will largely obviate the necessity for operative delivery at home, conservatism probably remains the better course: forceps should be reserved for cases where there is a clear indication and where all the conditions for a low-forceps delivery are fulfilled.

If these precautions are disregarded the result may be a "failed forceps." This disappointing and disconcerting sequel is discussed in some detail by Dr. R. G. Law in a paper on page 955 of this issue of the *Journal*. It is a complication which is not restricted to domiciliary practice, but in hospital the consequent problem of the method of choice for delivery is more easily resolved. Dr. Law points out, as others have done, that the three common causes of failure are unrecognized malposition of the head, incomplete dilatation of the cervix, and disproportion. More than one of these may be operative in any one case, and the first is more commonly the cause than both the others together. Disproportion is more likely to be overlooked in the multiparous woman, in whom the history of a normal delivery of an averaged-sized baby is no guarantee that there will be no difficulty with a larger foetus. It is surprising and indeed discouraging to note that there was a history of previous dystocia in 8 of the 16 multiparae in Law's series. He remarks on the difficulty there may be in diagnosing disproportion in the multigravid after the onset of labour, but in hospital more frequent recourse to intranatal radiography is very rewarding.

Failure due to incomplete cervical dilatation or to an unrecognized malposition points the moral that no one should embark on a forceps extraction unless experienced in vaginal palpation and in recognition of the "touch-picture" of the presenting part. The cervix should not be palpable either during contractions or in the intervals between them, and none of the head should be palpable abdominally. Dr. Law points out that for accurate diagnosis examination under anaesthesia may be necessary, but he wisely adds that the induction of anaesthesia does not and must not commit the obstetrician to undertake immediate delivery if the findings are adverse. The importance of this is amplified by Professor Jeffcoate, who graphically describes the tragic train of events, based on pride and prestige, which may ensue when unexpected difficulty is encountered in a forceps delivery because of an unrecognized malposition or contraction of the pelvic cavity, culminating in the substitution of force for skill and in the infliction of severe injury on mother and baby. He draws attention to the advisability of recognizing that there is a place for a "trial of forceps," a procedure first advocated nearly fifty years ago. He contends that if all mid-forceps deliveries in hospital were viewed as trial operations, the dread of failure would disappear from the mind of the operator and he would be happy not to proceed in the face of difficulty. This attitude might well be extended to cover all cases of forceps delivery, at home as well as in hospital, although if the precautions mentioned above for forceps delivery at home are observed a failure to deliver will be rare. Nevertheless errors of judgment can occur, and if each case were regarded as a trial of forceps, to be abandoned courageously if it did not proceed smoothly, then the current ignominy would be detached from the "failed forceps" to the benefit of all three individuals concerned, the mother, the baby, and, not least, the obstetrician.

PHENYLBUTAZONE ON TRIAL

There is a lot to be said for trial by jury compared with the ordeal by fire or water, and not least in the field of medicine. Clinical trial in the past, especially just after the introduction of a new drug, was apt to be an ordeal. If the patient survived and the drug seemed to aid the healing power of nature, the advertising began. But nicer distinctions are possible now, when the evidence is usually marshalled in such a way that it can be added up and assessed impartially by the jury of readers and by posterity. In the June issue of *Annals of the Rheumatic Diseases* there are three papers on the effects of treatment with phenylbutazone ("butazolidin"). They contrast notably with each other, each showing a different approach to what is eventually the same problem—namely, is this drug useful in the treatment of a particular disease? Each approach is appropriate to a certain stage of development of our knowledge: first, the trial tentative, giving grounds for belief that the substance might be useful; then the trial statistical, showing that, with a certain dosage for a certain time, one method of treatment shows results significantly or not significantly different from those of another; finally, the trial magisterial, when a substance already found to be useful is administered, and the results are stated, but without detailed comparisons with any other treatment. In this category falls the paper by J. P. Currie and his colleagues.[1]

Currie first brought phenylbutazone into current medical practice, and has therefore a longer experi-

ence of it than most. After reviewing the pharmacology of this and related drugs, he and his colleagues write in general of their experience with 424 patients with rheumatoid arthritis. These include 81 patients given injections whose cases were reported previously,[2] and we infer that most of the other patients received the drug by mouth. These authors claim that a blood level of 8–11 mg. per 100 ml. is needed for the suppression of symptoms in rheumatoid arthritis, and that this can usually be achieved by a dosage schedule of 800 mg. (in four doses) on the first day, followed either by 200 mg. per day thereafter (the earlier dosage schedule) or followed by 600 mg. for two days, 400 mg. for two days, and 200 mg. thereafter, as in the later dosage schedule. Complications were few (4.7%), and in only three cases was the treatment stopped because of them. (A rash appeared in one and oedema in two.) This contrasts markedly with the average of 23% listed from other series (range 0–100%), because of careful dosage and careful selection, "avoiding the aged and all suspected of having a poor cardiac reserve." Another factor was the introduction of keratin-coated tablets, administered to an unspecified number of patients, since which no digestive disturbances occurred. The results are given in the statement that 95% were subjectively improved ("pain, tenderness, and well-being"), 93% showed improved performance, and 30% showed objective improvement judged by joint measurements and appearance and sedimentation rate. The evidence for this statement has been assessed by the authors but is not available to the reader.

J. Fleming and G. Will, the authors of another paper[3] in the same issue, cite five cases of acute rheumatism whose recovery coincided (within a few days) with the giving of phenylbutazone. The patients had previously shown little or no response to salicylates. The evidence as presented is insufficient to convince the reader, for in a self-limited disease the chances of recovery occurring at a certain time in only five cases are obviously not entirely remote. The authors conclude in their summing up that these results are sufficient to "raise the hope that further experience will establish butazolidin as a useful drug in the treatment of acute rheumatic diseases."

By contrast in the same issue R. L. Mason[4] sets forth clearly and with all the evidence a comparison between the relative efficiency of phenylbutazone and corticotrophin in rheumatoid arthritis based on six patients. Despite this small number the conclusions can be seen to be soundly based, because all the evidence is available and analysed. Justice is not only done but is seen to be done. Mason found that phenylbutazone, in contrast to corticotrophin, produced no significant change in erythrocyte sedimentation rate or in joint size. A decrease was seen in 17-ketosteroid excretion compared with the usual increase during treatment with A.C.T.H. On the other hand the two types of treatment caused much the same decrease of pain and tenderness and much the same increase in function. Other controlled trials on rather larger series of cases[5-8] have shown with varying degrees of conclusiveness some superiority of phenylbutazone as an antirheumatic drug to such substances as "inert" tablets, saline, gentisate, amidopyrine, salicylate, and tab. codein. co., used in the various control series. In short, the evidence presented to date indicates that phenylbutazone is in many but not all cases of rheumatoid arthritis a more effective drug than aspirin in relieving pain and disability, but that it is also more dangerous; and it is similar in potency to corticotrophin in its effect on pain and function in that disease.

1 *Ann. rheum. Dis.*, 1953, **12**, 88.
2 *Lancet*, 1953, **2**, 15.
3 *Ann. rheum. Dis.*, 1953, **12**, 95.
4 Ibid., 1953, **12**, 82.
5 *Lancet*, 1953, **1**, 1227.
6 *J. Amer. med. Ass.*, 1952, **150**, 1087.
7 *British Medical Journal*, 1952, **2**, 1392
8 *Lancet*, 1953, **1**, 951.

PARATYPHOID FEVER AND CREAM CAKES

Some unusual features were found in the large outbreak of paratyphoid fever in South Wales during the summer of 1952.[1] The outbreak, which was confined to South Wales, lasted for five months and spread into four counties. About two-thirds of the 575 cases could be associated with some bakers' confectionery, and most of them with cakes containing synthetic cream. But immediate special inquiries into the synthetic cream showed that it could not be incriminated. It was made in England and distributed all over the country, and no other outbreaks were associated with it. Moreover, it was virtually sterile on arrival in Wales. When inoculated with paratyphoid bacilli the cream did not support the growth of the bacilli, though it was not actively bactericidal. Paratyphoid excretors were found on the staffs of four different bakeries, but the evidence suggests that they were the victims and not the originators of the outbreak. An examination of the sources of supplies of the bakeries which had sold infected cakes showed that flour was the only substance common to all the bakeries. This seemed a most unlikely substance to contain infection. On inquiry it was found that an ex-employee of the flour mills concerned, whose job was to fill the flour into sacks—one of the few persons in the mill who came into contact with flour—was a symptomless excretor, but he had left his employment before the outbreak started. Experiments then showed that paratyphoid bacilli remain viable for nearly a year in flour and multiply freely in slightly damp flour sacks. Flour

1 Thomson, S., *Monthly Bull. Minist. Hlth (Lond.)*, 1953, **12**. 187,

had hitherto been an unsuspected source of infection, and, although conclusive proof was lacking that it did carry the paratyphoid bacilli into the bakeries, the experiments showed that this was possible. Bread or cake soaked in water are excellent culture media for paratyphoid bacilli, and cake containing cream is also an excellent medium.

A brief summary is also given of former outbreaks of paratyphoid fever caused by bakers' confectionery. In nine of these no excretor was found, in thirteen there was one excretor, and in five there were several excretors. Dr. Scott Thomson, the author of the report, suggests that in many of the outbreaks of paratyphoid fever the evidence incriminating the excretor in the bakehouse as the source of the infection is not very convincing.

MEDICAL NEEDS IN THE GOLD COAST

It has been an aim of medical administration in the British Colonies that the quality of medical care should not fall below the standards applied in Britain. In some Colonies there are too few doctors to cover the population adequately, and in those where there is a grave shortage some of the inhabitants cannot have their illnesses treated by qualified men. A demand therefore comes for official recognition of unqualified practitioners, on the false analogy that half a loaf is better than no bread. Elsewhere in this issue Mr. Ian Fraser, who visited the Gold Coast earlier this year at the request of the Council of the B.M.A., describes the precarious position of the medical services in that Colony, which now has a wide measure of self-government and is being quickly developed in other ways. Junior medical officers are required everywhere, and, as will be seen from Mr. Fraser's article, the shortage of specialists in a country which is already building a 510-bedded hospital is disastrous.

In the long run the Gold Coast's medical needs will be met by African doctors, and Mr. Fraser stresses the necessity for helping the African student and doctor to become well qualified. British medical schools can and do play an important part in training African doctors, but when the new hospitals are opened in the Gold Coast there is going to be a greater need than ever of specialists to undertake treatment and to train junior members of the staff. Where are these specialists to come from? Uncertainty about the period of time which will elapse before the Gold Coast government may feel it can dispense with British doctors causes concern to the medical officers already in the Colony, and is bound to affect recruitment adversely. But, as Mr. Fraser makes quite plain, the Gold Coast offers wonderful opportunities to medical men and women who are prepared to put up with the familiar disadvantages of life in the Tropics and the less well known problems of working for the government of a country subject to rapid economic and political change. Even so, most doctors contemplating service in the Gold Coast will want some assurance that they will not suddenly find themselves discarded. The B.M.A. is consulting the Colonial Office on this matter, which bristles with administrative difficulties. It may be that an eventual solution will be found in the establishment of a Commonwealth Civil Service.[1]

[1] *The Times*, September 7 and 8, 1953.

NOBEL LAUREATES IN MEDICINE

The Nobel Prize for Medicine and Physiology has been awarded jointly to Professor H. A. Krebs, F.R.S., of Sheffield University, and Professor F. A. Lipmann, of Harvard University, U.S.A. Both are distinguished biochemists who have carried out important studies on intermediary metabolism, and both are refugees from the tyranny that brought their native Germany to ruins.

In 1933 a Rockefeller grant enabled Dr. Krebs to come to Britain as a research student at Cambridge University. Two years later he moved to Sheffield under Sir Edward Mellanby, and in 1945 was promoted professor there and director of a Medical Research Council unit for research in cell metabolism. In 1947 he was elected F.R.S.

According to the official citation Professor Krebs receives his award in recognition of his discovery of the citric acid cycle in the metabolism of carbohydrates —now commonly called the Krebs cycle. In his crucial experiments pyruvic acid, which is formed in the earlier stages of carbohydrate metabolism, was mixed with oxaloacetic acid and was incubated with minced muscle in the absence of air. Citric acid was formed, with the elimination of carbon dioxide. Further losses of carbon dioxide produced α-ketoglutaric acid and succinic acid, and the cycle was then completed through fumaric and malic acids back to oxaloacetic acid, which was ready to combine with more pyruvic acid. In tracing the course of this cycle Krebs was not breaking entirely new ground, but he has solved problems which had long puzzled many workers in a crowded field of research, and he has illuminated what had previously been a maze of obscurities. During the war Krebs showed his abilities in other directions. On the resignation of Dr. Kenneth Mellanby from the Sorby Research Institute he took over the care of a group of conscientious objectors who helped in experiments on vitamin deficiencies for the M.R.C. His enthusiasm helped to sustain the volunteers through the boredom of subsisting through long periods on monotonous diets.

Professor Lipmann receives his part of the prize for his work on co-enzyme A. This factor, which is concerned with the metabolism of two-carbon fragments, plays a part in metabolic processes which are related to the Krebs cycle. The two discoveries for which the award has been shared, however, may be considered as independent in their origin. It was in 1939 that Lipmann was obliged to leave Germany because of Nazi persecution, and he arrived without funds in the U.S.A. A place was found for him at the Massachusetts General Hospital, and in 1941 he became head of the biochemical research laboratory. In 1951 he was appointed professor of biological chemistry at Harvard Medical School.

CLINICAL PATHOLOGY IN GENERAL PRACTICE

PLEURAL, PERICARDIAL, AND PERITONEAL TAP

BY

THOMAS PARKINSON, M.D., M.R.C.P.

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Laboratory examination of serous effusions is a valuable adjunct to clinical diagnosis. The interpretation of the pathological changes in these fluids will be described later in this series. The present article is concerned only with the methods of obtaining specimens for examination. The technique of diagnostic pleural tap is described in detail, since this procedure is the one most often called for in practice. Pericardial tap, which is seldom indicated, and peritoneal tap, which is less informative, are described more broadly, some of the detail previously described being assumed.

Pleural Tap

Aspiration of pleural fluid for diagnostic purposes is an easy and safe procedure. It should, however, be carried out only when the diagnosis of pleural effusion has been made with confidence, the diagnosis preferably having been confirmed radiologically. It should not be used blindly to discover whether fluid is present or not. Serious complications often follow the insertion of a needle into hydatid cysts, lung abscesses, and other intrathoracic lesions which might simulate pleural effusion on clinical examination. Whenever doubt exists recourse should be made to accurate radiological diagnosis by postero-anterior and lateral films before aspiration is done.

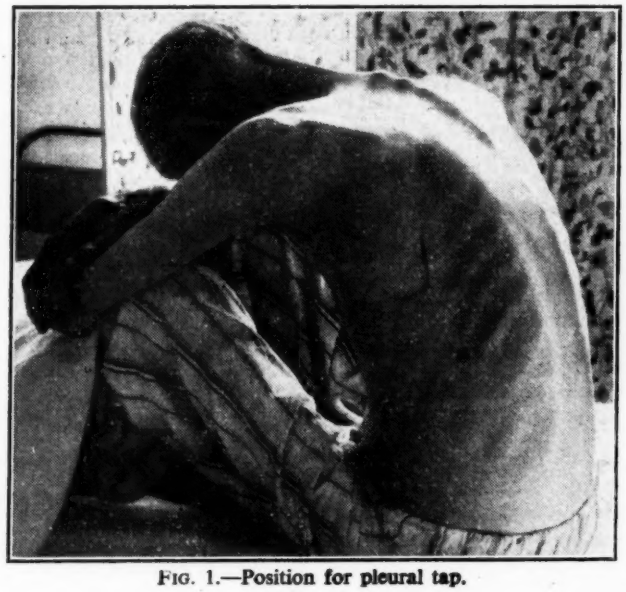


FIG. 1.—Position for pleural tap.

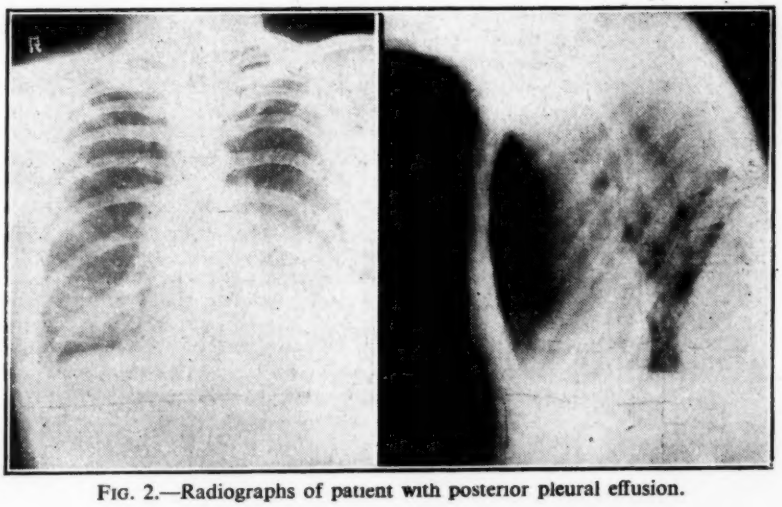


FIG. 2.—Radiographs of patient with posterior pleural effusion.

Apparatus.—Only the simplest instruments are required, and the following should suffice: a 2-ml. syringe; a hypodermic needle, size 17 (B.W.G. 25); a hypodermic needle, size 1 (B.W.G. 21); a 20-ml. syringe; a wide-bore chest-aspiration needle (B.W.G. 16) to fit the 20-ml. syringe; sterile containers; sterile 2% procaine; swabs; gallipots; sterile towel; cetrimide and surgical spirit or iodine; and surgical tape or collodion. The needles should fit the syringe nozzles exactly. The connexions must be airtight. The wide-bore aspiration needle should be thick enough to allow withdrawal of pus should this be encountered.

Preparation of Patient.—Diagnostic tap is an almost painless operation and usually no premedication is required, but a patient who is unduly anxious or who has a persistent cough should have ¼ gr. (16 mg.) of morphine half an hour beforehand. He should be placed in a posture which is comfortable to himself and convenient to the physician. A patient who is well enough may sit forward in bed with the knees flexed, the arms folded in front with the elbows resting on the knees and the head resting on the forearms (Fig. 1). The legs should be freed from the weight of the bedclothes to allow the knees to bend, since it is uncomfortable to lean forward with the knees straight. A patient who is not so well should be propped forward on a bed-rest or supported at the shoulders by an assistant.

Site of Aspiration.—In large effusions the best site for aspiration is in the ninth intercostal space in the posterior axillary line. The tip of the scapula, which lies over the seventh rib, is the most useful landmark in finding the right intercostal space. In smaller or localized effusions the needle should be inserted over the area of maximal dullness to percussion, but in such cases radiological location of the effusion should be carried out whenever possible. Lateral radiographs often show that an effusion is localized in the posterior part of the thorax in the paravertebral gutter, and in such cases aspiration should be carried out near the vertebral border. The radiographs of a patient with a posterior pleural effusion are shown in Fig. 2. It is clear that exploration in the posterior axillary line in such a patient would be fruitless, since the needle would pass in front of the effusion.

Technique of Pleural Tap

A wide area of skin around the site of operation is cleaned with cetrimide and iodine or surgical spirit. The 2-ml. syringe is then filled with 2% procaine and, using the size 17 hypodermic needle, a small bleb is made under the skin at the elected site of aspiration. The needle is then withdrawn, removed from the syringe, and replaced by the size 1 needle. After waiting about two minutes for the local analgesic to take effect

the deeper tissues are anaesthetized by injecting 2% procaine through the size 1 needle, which is advanced slowly until it is felt to pierce the parietal pleura. Not more than 2 ml. of procaine is required for this. The needle is then withdrawn and a further few minutes allowed for full analgesia to develop. The wide-bore needle is then attached firmly to the 20-ml. syringe, and the syringe tested by making sure the plunger moves freely up and down the barrel. With the syringe held firmly, the aspiration needle is pushed slowly but steadily through the intercostal space. During this procedure it is often helpful to rest the forefinger of the operating hand against the chest wall and to rest the flexed middle finger half-way down the needle (Fig. 3). This guards against the needle being thrust too deeply into the thorax when the skin resistance is suddenly overcome. A distinct "give" is felt when the needle pierces the pleura. The plunger of the syringe is then pulled back and the syringe filled with 20 ml. of pleural fluid. The aspiration needle is then withdrawn from the chest wall, and a small piece of gauze or wool is placed over the needle-hole with the other hand.

The pleural fluid is immediately transferred to the sterile specimen bottle before the fluid has time to clot. A small dressing is applied to the chest over the site of aspiration by means of adhesive tape or collodion. The specimen is labelled and dispatched without delay. Difficulty is seldom encountered except when there is a grossly thickened pleura or sometimes when the pleural space contains blood clot or thick pus. If fluid is not obtained easily the needle should be withdrawn and not be pushed forward aimlessly into the chest, since this entails risk of complications. The usual causes of difficulty are faulty choice of site or mistaken diagnosis. Failure to withdraw fluid should lead to careful reconsideration of these simple matters and not to adventurous blind exploits into the thorax. Performed in this way pleural tap carries little or no risk. Pleural shock is never encountered. Care should always be taken to avoid introducing air into the pleura.

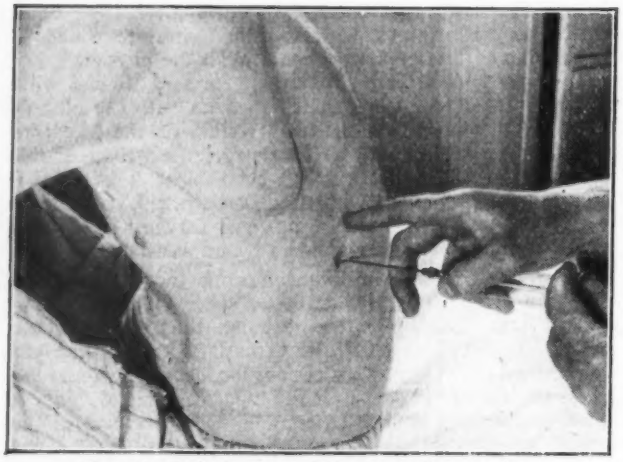


FIG. 3.—Introduction of the aspiration needle.

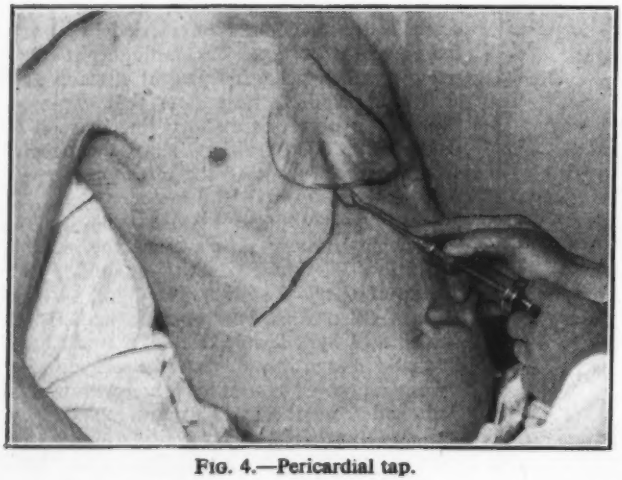


FIG. 4.—Pericardial tap.

Pericardial Tap

Although large pericardial effusions may be easy to diagnose and safe to aspirate, small effusions are extremely difficult to recognize with certainty and their aspiration is fraught with difficulty. Even with full radiological and cardiographical facilities small pericardial effusions may be difficult to differentiate from cardiac enlargement. Diagnostic pericardial tap is therefore of very limited application in general practice.

Pericardial effusions may be aspirated from in front by inserting a needle through the chest wall, or from below by approaching the pericardium from the costal angle. The second method is preferable because it gives access to the most dependent part of the pericardial sac, where small effusions first gravitate, and also because it is free from the risks of injuring and infecting the pleura, to which the anterior approach is particularly prone. The subcostal approach, which is both easier and safer, should be the method of choice.

With the patient sitting upright and propped comfortably on pillows the gap between the xiphoid process and the left costal margin is palpated, and the skin in this area infiltrated with 2% procaine. The deeper structures are then anaesthetized. A wide-bore needle with a sharp edge but a blunt bevel is securely attached to the 20-ml. syringe, and the pericardium is explored by pushing the needle steadily and firmly from the left subcostal angle. The needle is directed upwards and backwards and slightly towards the midline (Fig. 4). As the pericardium is entered a sudden fall of resistance is felt. Then 20 ml. of pericardial fluid is withdrawn and transferred to a sterile container. The risk of injuring the heart muscle in pericardial tap has often been exaggerated. If the needle is pushed too far a distinct grating can be felt as soon as the needle-point touches the contracting heart muscle. If the needle is withdrawn slightly when this is felt, no damage will be done. Even with greatly dilated hearts, where confusion with pericardial effusions is most likely to arise, it is easy to feel when the heart wall is touched, and the danger of rupturing or penetrating the heart wall is extremely remote.

Peritoneal Tap

Aspiration of ascitic fluid for diagnostic purposes is not commonly practised, since the information gained thereby is seldom of much help in clinical diagnosis. Physical examination is of paramount value in diagnosing the cause of ascites. If, however, peritoneal fluid is required for examination it can readily be obtained by inserting a needle through the abdominal wall. Before aspiration is attempted, two fundamental precautions must be observed. First, it is essential that the patient's bladder should be empty, and to avoid any risk of injuring the bladder-wall it is safer to catheterize the patient. Secondly, in the female a pelvic examination should be done to exclude as fully as possible the alternative diagnosis of ovarian cyst, which so often resembles ascites.

The best site for aspiration is a point midway between the umbilicus and the anterior superior spine of the ileum. When this point is found, the skin and deep structures are anaesthetized with 2% procaine. A wide-bore needle attached to the 20-ml. syringe is then plunged firmly through the abdominal wall and 20 ml. of fluid withdrawn and transferred to a sterile container.

Next Article on Clinical Pathology.—"Lumbar Puncture," by Dr. William Gooddy.

SHORTAGE OF MEDICAL OFFICERS IN THE GOLD COAST

BY

IAN FRASER, D.S.O., O.B.E., M.D., M.Ch., F.R.C.S.

Earlier this year Mr. Fraser visited the Gold Coast at the request of the Council of the B.M.A., which had been considering the desirability of forming a Gold Coast Branch. In this article he describes the medical problems of the colony.

The present shortage of medical officers in the Gold Coast is causing anxiety, both in the colony itself and at home. There is a shortage of men in all branches of medical practice—shortage of medical officers for out-stations and for the medical field units, and shortage of specialists. These posts have in the past been filled partly by Africans trained in the medical schools in the United Kingdom, and the cost of this has been borne mostly by the Gold Coast Government, with the understanding that when qualified they would return either as junior medical officers, or, possessing higher qualifications, to fill some of the many specialist posts available. The result has been a little disappointing. Some of the men who have qualified in the United Kingdom have decided to stay here. Others have returned to the Gold Coast, but have soon left the service to take up the more lucrative private practice; and so the colony as a whole has not benefited to the extent that was hoped for. Very few have become specialists, because few of the senior specialists have the time or the facilities to introduce the young men returning to the colony to more advanced surgery or medicine, and so give them the basic training in a specialty that would later require only a short postgraduate course in the United Kingdom to enable them to obtain a higher degree.

Help in Qualification

Since 1948, with an increase in trainee specialists in the United Kingdom, as many as 400 candidates at a time may have attempted to pass higher examinations like the F.R.C.S. and M.R.C.P., with the possibility of 40 to 50 of them getting through. Obviously the chances of passing for young medical officers trained in the colony were diminished in the face of such stiff competition, though this state of affairs may be passing off now. I feel that something must be done to help the African student and doctor to become well qualified. There should be no question of lowering standards, but facilities should be improved. In England the facilities remain constant and are always available; but they are expensive and demand time. Therefore teaching in the colony itself must improve, and this means more teachers and more specialists, and hospitals which cater for a wider range of specialties.

The average hospital in the colony to-day consists of surgical wards, medical wards, a maternity ward, and a children's ward. The medical staff varies in quantity and quality. In some instances there may be only one medical officer capable of doing routine surgery, and he may be also responsible for dealing with gynaecology and complicated midwifery. The average list includes such cases as hernia, hydrocele, trauma, sepsis, ectopic pregnancy, hysterectomy, etc., and one surgeon has just completed a series of 150 operations for vesico-vaginal fistula. Another, a young African, had performed 97 caesarean sections within a few months. In one area two extrauterine pregnancies have to be dealt with every week. It will thus be seen that there is ample opportunity for practical experience.

The European or expatriate doctor starts at an advantage. He has found the examination in the United Kingdom easier and begins at a younger age. It is also easier for him to return on study leave and work for higher qualifications. Therefore up to now the majority of the specialist posts have been filled by expatriates. Even so, there have always been too few of them; they have been so busy with routine work that teaching and organization of a department have been impossible, and, with the shortage of junior staff, no young doctor is left long enough in a potential teaching centre to get trained. After a brief stay he is hurried off to a district station where the need for his services is great; once there, his chances of specialization are increasingly difficult.

The expatriate specialist becomes more valuable to the colony the longer he stays there. He may in time have to maintain a home in the United Kingdom so that his children may be educated there; and this is costly. With the increased cost of living in the Gold Coast, these senior medical officers and specialists are finding their salaries insufficient, and many are tending to leave the service. It is most important something should be done to halt this tendency, and immediate replacement must be found when they do go.

In the next ten years the Gold Coast will experience one of the most interesting and dramatic expansions in its history. Money is being spent lavishly in many necessary projects—a new town, a new harbour, the Volta scheme, a new university, and a new hospital costing £5,000,000 for its 510 beds. These and other schemes will cost in the region of £144,000,000. This gives some idea of the expansion. Yet at the moment there are three surgeons for 4,500,000 people, one gynaecologist, no eye specialist, no ear, nose, and throat specialist, no dermatologist, no tuberculosis specialist (tuberculosis is very prevalent), no anaesthetist, no paediatrician, no orthopaedic specialist (yet injury is becoming increasingly more frequent, and will become still more so with the new mechanization). Yet at home here in Britain there are some 60 to 70 candidates for every hospital appointment; at a recent appointment there were two applicants—specialists—actually drawing unemployment benefit. What a contrast! And what wasted opportunity!

In a letter to the *Lancet* of April 11 this year a registrar wrote this: "There must be many hundreds of us throughout the country, growing yearly more hopeless, a stagnant pool of cheap specialists, deliberately created by the National Health Service. A great many of us have been qualified for ten to fourteen years, but we are paid less than a newly settled general practitioner. We are liable to dismissal at short notice and at regular intervals. We can settle nowhere and we can plan nothing. It is obvious that we cannot all become consultants overnight." But there are parts of the world where opportunities and vacancies are waiting, and the Gold Coast offers these to-day. Though one may sympathize with these young men it is difficult to understand the attitude of those who would rather do nothing and starve at home than go abroad and practise real medicine, with unrivalled opportunities for experience.

The man willing to do this must be of the right type; his integrity must be beyond question; he must be able to improvise, to turn his hand to anything. As a surgeon he may in the course of an afternoon have to remove a ruptured speen, deal with an ectopic pregnancy, sew up or amputate a leg bitten by a crocodile, and perhaps repair a deep stab wound. An elephantiasis of the scrotum touching the ground may be thrown in for good measure. If he has a wife with the pioneering spirit—one who is a good companion as well as a wife—he will be doubly fortunate.

Reasons for the Shortage

Why are not enough British doctors going to places like the Gold Coast? One reason is that Africanization is going to exclude them from some of the higher positions. Certainly this will happen in time, but at the moment the question does not arise. It will be long before there are enough senior Africans of experience to take all the jobs in the various specialties and also fill the higher adminis-

trative posts. The obvious need in the Gold Coast is to increase the number of specialist posts and fill them with people of integrity and ability, with the skill to teach the younger generation and so build up a lasting service—the specialist at the top, the medical officers below, in training to become specialists, and dispensers, sisters, nurses, etc., all trained to a higher level. The standard of work in hospitals will rise, and the hospitals become recognized as suitable for the training of medical students. Only when all this happens should the Gold Coast consider forming a medical faculty. Certain back-benchers, with little knowledge of facts, may press for the early formation of such a faculty. It would be just as valuable as a Rolls-Royce car with no one able to drive it properly.

In the Gold Coast, therefore, the specialist service is priority No. 1. In the United Kingdom the men are available, but the colony must make the conditions attractive. In every country there is always the difficulty of paying for one service more than for another. Why should the doctor get more than the engineer? It is clear, I think, that he should. He spends himself more, his daily responsibilities are greater, he gives a 24-hour service, and he is doing more than curing an individual life—he is making a permanent service.

As I have pointed out, when the specialist is at an age to give his best to the colony his home commitments are unfortunately at their heaviest, and often that is the stage when he retires, as many are threatening to do at the moment. Some attraction must be offered these men, especially during the next ten years. If the present service deteriorates further it will be difficult to build it up again with new people. Better pay and some security of tenure, or compensation, would attract better men and women.

Appointments Available

The appointments in the Gold Coast are very varied: a medical officer of health to a port authority; a doctor to a bauxite mine, a diamond mine, or a gold mine; a specialist in every branch of medicine; a practitioner in a town; a practitioner in a country station; or, best of all, a bush doctor, with a shot-gun and the midwifery forceps both kept at the "ready" in the back seat of the car. At the moment there are many attractive short-time contracts whereby one can see the country. Having recently revisited the colony after an absence of ten years, I found that in the interval progress has been equivalent to that of 50 years at home.

But the shortage of doctors is being made good in a makeshift manner. Many areas are without a qualified doctor, and dispensers and dressers are doing the work, with perhaps a call every few weeks from the medical officer at the nearest station. This is a sad state of affairs. It is bad medicine and is dangerous: it is putting power into the hands of untrained and sometimes unscrupulous, greedy people. It is hard to be critical, as the gaps have to be filled. Some are allowed to practise with degrees of doubtful validity, and, finally, there is a tendency for the foreign doctor to infiltrate—Poles, Swiss, Germans, some stateless. One is not in a position in all cases to criticize their medical ability, but most of them have not the same interest in the Gold Coast as has the British doctor, with his long connexion with the colony: the interest of the former in the colony is that it affords a good living, but they give little in return in the way of teaching or in building up a service.

Conclusion

The next few years will be critical. The future of the medical service of the colony will depend upon whom we send out. The present service, its link with teaching, and its improvement in hospital work, will make up the foundation of the medical school. With the eventual formation of a medical school real Africanization of the service can be envisaged. Till then, promotion, if it is to be fair and if the appointments are to carry respect, must be made through merit and experience, and by no other way.

NOBEL PRIZE

[*Walter Stoneman, London*

Professor H. A. Krebs, director of the Medical Research Council's Cell Metabolism Unit at Sheffield, who has been awarded the Nobel Prize for Medicine jointly with Professor F. A. Lipmann, of Harvard (see p. 984).

SEVENTH INTERNATIONAL PAEDIATRIC CONGRESS

[From a Special Correspondent]

The Seventh International Paediatric Congress was held in Havana from October 12 to 17 under the presidency of Professor Felix Hurtado. The opening ceremony was performed in the House of Representatives in the beautiful National Capitol Building on Columbus Day by President Batista, who gave a moving address on the need for child care. The British delegation of twelve was led by Dr. Bernard Schlesinger, President of the British Paediatric Association; Professor Alan Moncrieff represented H.M. Government. Nearly 50 countries were represented, and altogether nearly 2,000 registrations were made.

Epilepsy in Childhood

The first plenary session was devoted to epilepsy in infancy and childhood. Professor C. H. Alström (Sweden) dealt with genetic problems, stressing the fact that acquired causes were more important than heredity factors. He emphasized that the risks in marriage as regards transmitting epilepsy were of the same order as for the majority of the population, provided that the affected parent was of normal mentality. Professor I. McQuarrie (U.S.A.) traced the story of water balance in relation to epilepsy from the discovery that dehydration reduced the number of fits, to the modern use of deoxycortone acetate as an adjuvant to drug therapy. Professor M. A. Perlstein (U.S.A.), in a review of drug treatment, gave much wise advice. There was "more to it" than drugs in treating epilepsy. It was better

to have convulsions and be normal in between than to walk about in a state of coma. It was clinical cure that was sought, not a completely normal E.E.G. tracing. Any new drug given with enthusiasm would help for a time, and caution was advised in accepting claims for new drugs. Nevertheless, it was important to try everything and use the drug that worked best. Professor W. LENNOX (U.S.A.) looked back over a long experience and pleaded for a better attitude to epilepsy as a public health problem. The first step was to remove all fear of the disease. Professor F. ESCARDO (Argentine) discussed certain unusual forms of epilepsy, and Dr. J. PICAZA (Cuba) surgical treatment.

A special evening session on social problems in paediatrics concluded the first day. Professor R. DEBRÉ (France) discussed international aspects in an account of the origin and present-day work of Unicef, which had recently had its mandate renewed by U.N.O. for an indefinite period. He was followed by Dr. E. MOURE (Cuba), who gave a wide review of the social work done for children in her country, with many challenging conceptions of the rights of the child, which the chairman—Dr. M. WEGMAN (U.S.A.—Regional Office of W.H.O. in Washington)—thought might not altogether gain acceptance "in a country a little further north." Dr. R. VALDÉS DIAZ (Cuba) described the work of the National Organization of Children's Dispensaries. Dr. S. FARBER (U.S.A.) spoke about the ideals of paediatrics which might be achieved in a children's hospital, Dr. R. DEL CASTILLO (Cuba) on rehabilitation of the paralysed child, and Dr. P. DANIEL MARTINEZ (Mexico) on maternity and child welfare in relation to health.

Congenital Heart Disease

The second plenary session, on congenital heart disease, was presided over by Professor A. CASTELLANOS (Cuba), who has done so much original work in this field. Dr. J. LIND (Sweden) dealt with technical advances in diagnosis, particularly with modern angiocardiography with simultaneous E.C.G. markings on the film. He gave a stern warning about the dangers of too much radiation in the investigation of small infants. Professor I. CHAVEZ (Mexico) then dealt with acyanotic heart disease—especially coarctation of the aorta and patent ductus arteriosus, followed by Professor R. KREUTZER (Argentine) on unusual types of pulmonary stenosis, a subject also dealt with more briefly in a subsequent contribution by Professor B. GASSUL (U.S.A.). Professor S. GIBSON (U.S.A.) brought the audience back to the bedside with an excellent account of the use of "eyes, ears, and hands" in the diagnosis of congenital heart disease, and Dr. HELEN TAUSSIG (U.S.A.), from her wide experience, discussed the results of operative treatment.

Prematurity

The third plenary session tackled some of the problems of premature infants. Professor A. YLPPÖ (Finland) surveyed the subject with special reference to his own country. There, as a contribution to the preventive side, every expectant mother must attend for antenatal care not later than the fourth month or she forfeits maternity benefit. Among measures for the care of the prematurely born he favoured gastric oxygen, early administration of fluid, and breast milk from the second day. He was pessimistic about reducing mortality below 20%. Professor H. HUNGERLAND (Germany), after remarking that modern methods of feeding premature babies did not differ much from those recommended by the older German authorities, went on to review in some detail problems of nutrition and metabolism. Professor M. Lamy (France) presented a paper for Professor M. LELONG on an interesting group of cases of retrolental fibroplasia in which partial regression had occurred. Professor C. SMITH (U.S.A.) surveyed the question of the importance of the respiratory system after premature birth, pointing out that many premature infants ventilate their lungs better soon after birth than a few hours later. Boston Lying-in Hospital had obtained a mortality rate among the premature infants of only 14.5% in 1950. Professor J. OBES-POLLERI (Uruguay) suggested that, whereas post-natal care had very greatly improved, pre-natal problems and what he termed the "crisis of birth" still merited more attention. Professor A. MONCRIEFF (Great Britain) spoke of his twenty years' experience since getting on the staff of Queen Charlotte's Hospital. He pointed out that the percentage survival rate (to 28 days) of premature babies born at home in England and Wales in 1950 had been 86%, which made the results 0.5% better than the ideal conditions in hospital in Boston. He also showed how the deaths under 4 weeks for 1,000 live births ascribed to prematurity had fallen from 16 in 1931 to 5.6 in 1951. Professor B. VAHLQUIST (Sweden) discussed work on the causation of anaemia in premature infants, stressing that infection was no longer an important factor, and that inherent differences existed between the red cells in prematurity and in mature babies and later infancy. Dr. L. TORRES BARBOSA (Brazil) concluded with an account of official measures used for the care of premature babies in his country.

Complications of Primary Tuberculosis

The fourth plenary session dealt with the complications of primary tuberculosis. Professor A. WALLGREN (Sweden) first reviewed the ordinary course of primary infection, taking the skin as the simplest site to study this. He classified complications under local disease and systemic disease. Under the former heading came extension of the tuberculous lesion and the part played by secondary bacterial infection of a non-specific type. The systemic spread mainly meant meningitis, about which several subsequent speakers gave their experiences. Dr. EDITH LINCOLN (U.S.A.) discussed a group of nearly 1,000 cases of primary infection seen at the Bellevue Hospital, New York City. A mortality of 21.5% in the period 1930–46 was reduced to 4.5% when streptomycin and adjuvant drugs came in, and to 1.4% with the advent of isonicotinic hydrazide. With this last drug the use of intrathecal streptomycin had been practically eliminated. Professor R. DEBRÉ (France) was, on the contrary, not at all happy about the present tendency to omit intrathecal therapy. He stressed the prognostic importance of the state of consciousness on admission together with electroencephalographic examinations. He also stressed the great improvement with isonicotinic hydrazide. A paper from Professor C. COCCHI (Italy) (read on his behalf) also stressed the need for intrathecal treatment, although with modern adjuvants smaller doses would probably be used. Dr. B. SCHLESINGER (Great Britain) presented a study of over 400 children with primary tuberculosis followed at Great Ormond Street from 1945 to 1953 with a total mortality of 14%. He stressed that with good home conditions a large group could be treated and supervised as outpatients. Bronchoscopy had proved of limited value. Lobectomy in a small number (7) of patients indicated that more use might be made of this form of radical treatment in selected cases. Dr. A. SCROGGIE (Chile) described chronic massive lung collapse as one of the troublesome complications.

Metabolism and Nutrition

The last plenary session was a mixture of communications on various aspects of metabolic and nutritional disorders. Professor P. GYORGY (U.S.A.) described the discovery of a new "growth factor" in human milk. The first step had been the finding of a specific variant of *Lactobacillus bifidus* (from the stools of a breast-fed infant) which required this specific factor for growth. On studying the factor it was found to be present in forty times the concentration in human milk as compared with cow's milk. This new factor was different from all the known vitamins and growth factors. In concentrated form it had been shown to stimulate the growth of young rats and to have an inhibitory effect on the growth of certain viruses. Professor G. FANCONI (Switzerland) discussed the part played by the kidney in regulating chemical metabolism and gave a fascinating account of the clinical significance of the functions of the proximal and distal tubules. Professor D. DARROW

(U.S.A.) talked on the treatment of infantile diarrhoea, stressing that this was still a major cause of death in many parts of the world, and children who died did so because of chemical disturbances. He outlined the fundamental changes in water and electrolytes, and from this deduced a logical plan for treatment. Professor E. Holt (U.S.A.) thought that great caution should be exercised before accepting the implications suggested by Gyorgy's paper. He thought its clinical importance had still to be proved, and he put up a spirited defence of the cow. His communication dealt with the findings that both in healthy and in diseased states the absorption of foodstuffs could be increased by an increased intake. Professor R. Ramos (Spain) added electroencephalographic changes to the list of disturbances suffered by infants with diarrhoea. He stressed especially the need to restore the blood volume to normal. Professor G. Frontali (Italy) spoke of nutritional oedema and protein deficiency as studied in his country, and Professor F. Gómez (Mexico) gave data on the cure of so-called deficiency complications of diarrhoea and severe malnutrition without the use of commercial vitamin preparations.

In addition to the main sessions there were nearly 30 "round tables" for discussions on selected subjects, several "free sessions" for communications not on the main chosen themes, and a "grand forum," where questions were answered by an impressive panel. The scientific exhibition was of a high quality. The congress concluded with a banquet, and, as with most of the social events, it was colourful and lively. The next international paediatric congress is planned for 1956 in Copenhagen.

INSTITUTE OF CLINICAL RESEARCH

NEW FACILITIES AT THE MIDDLESEX

An Institute of Clinical Research and Experimental Medicine in association with Middlesex Hospital Medical School was opened at an informal gathering on October 22, when the staff of the hospital and school and a number of distinguished visitors attended a reception given by the chairman of the hospital, Colonel J. J. Astor. The Institute is housed in a large building of four stories in Hanson Street, a few minutes' walk from the hospital, and is furnished and equipped on the most generous modern scale.

The new Institute takes its place alongside the existing institutes and departments associated with the Middlesex—the Bland-Sutton Institute of Pathology, the Courtauld Institute of Biochemistry, and the Barnato Joel Laboratories of Physics. Its purpose is to provide the consultants of the hospital with research facilities for their exclusive use, and it is said to be the first such provision made by a British hospital for its clinicians. A clinical research committee is responsible for its control and also for reviewing applications for grants. Any member of the consulting staff of the Middlesex is entitled to put forward or sponsor a project for research, and the committee, if it accepts the application, may allocate—for a limited time in the first instance—either money or space, equipment, and facilities in the building. To maintain the high technical standards for a comprehensive institute of this description, liaison is maintained with the existing medical school departments, and, in addition to the technicians in charge of the pathological laboratory, the biochemistry laboratories, and the workshop, there are attached as advisory technicians those who are at the head of the technical staff of the Bland-Sutton Institute, the Courtauld Institute, and the Barnato Joel Laboratories respectively.

Endowment Funds Freed

This handsome provision has been made possible by the freeing of the endowment funds which the Middlesex, like many other hospitals, had in its possession when the National Health Service Act came in. The suggestion was made that part of the income from such funds should be spent on medical research, and on a proposal from the medical committee the board of governors decided to allocate approximately two-thirds of the available money to projects falling under the head of clinical research. It became evident at once, however, that if the money was to be wisely and economically used space and facilities must be provided for clinicians desiring to carry out such work. In 1949 accordingly the present building, originally a boys' club, which had been erected ten years before, was purchased and structurally adapted to this new purpose. Altogether well over £100,000 has been spent on the purchase and conversion of the building and its equipment. The director of the Institute is Professor A. Kekwick.

A Tour of the Building

The main laboratory provision is on the second floor, where there is a large pathological laboratory, two biochemical laboratories, a workshop, and a small isotope room. Measuring and testing instruments, some of them familiar and some less so, were laid out on the benches for the inspection of the visitors—a photoelectric absorptiometer, a flame photometer, oscillographs, an electronic testmeter, freezing and base-sledge micrometers, microscopes, and the like, and in the workshop precision lathes and many other devices. On the first floor are five small individual laboratories, also library, reading, and record rooms, and administrative offices, as well as a large conference hall.

The ground floor provides six consulting-rooms of different types and sizes. The largest of these has six examination couches, with screens, trolleys, and all facilities. They are furnished rather more comfortably than the usual hospital consulting-room, because the patients for whom they will be used, whether from the hospital or privately, will be those who have volunteered for the research, and it is felt that they are entitled to a certain extra degree of comfort. There are also on this floor a nurses' room and a waiting-room.

The top floor has been assigned for work on animals. Here there are two air-conditioned animal houses, a preparation room and operation theatre with a recovery cubicle, and an isolation house. Above the animal houses is a large extent of flat roof wired in to allow open-air runs for the animals. In the basement is an *x*-ray set with a generator, to which other equipment can be added if necessary.

Among the projects already in view or started is an investigation of cancer of the lung and its causes; another is the tracing of the growth of bone by means of radioactive isotopes; and a third the development of a synthetic bone for grafting when the natural bone has been destroyed by disease. New drugs for use in breast cancer will be tested, and another investigation concerns the movement of bacteria in the nose in colds and other catarrhal conditions.

THE CARE OF MENTAL DEFECTIVES

MINISTER OF HEALTH AT FOUNTAIN HOSPITAL

The Fountain Hospital at Tooting Grove, London, which accommodates nearly 600 mentally defective children, mainly of the idiot and imbecile grades, was visited by the Minister of Health, Mr. Iain Macleod, on October 23 on the occasion of its sixtieth anniversary. The institution began as a temporary fever hospital, and not until 1912 was it devoted to its present purpose by the Metropolitan Asylums Board. It was taken over by the London County Council in 1929, and transferred to the South-west Metropolitan Regional Hospital Board in 1948. The children, at work and play, were inspected by the visitors attending the celebration, and the results of their handicrafts were shown.

Mr. Macleod said that when it became possible a month or two ago to allocate an extra two million pounds to capital expenditure in the National Health Service he arranged that one million of that sum should be devoted to the mental health side of the Service. This had been

done with the full sympathy and consent of Mr. Butler, the Chancellor of the Exchequer, who was himself President of the National Association for Mental Health. It was important that the mental health services should be brought more closely into line with the rest of the Health Service so that people would not think that mental disease was something to be shunned and forgotten.

The Royal Commission

The newly announced appointment of a Royal Commission on mental illness and mental deficiency was a matter of great moment (see p. 998). Much of the law in these fields was out of date and out of tune with modern thought. One of the problems needing examination before any new legislation was whether the voluntary method of entering mental homes and hospitals should be extended, and whether there should be a much less formal entry into mental deficiency institutions. It was interesting to note that 70% of those who entered mental hospitals to-day did so as voluntary patients and that 40% even of those who entered as certified patients recovered within the first year of their certification. "Although many of our buildings are out of date," the Minister added, "I have no doubt at all that our treatment in the mental health field leads the world." Another matter which would doubtless be considered by the Royal Commission was the definition of mental deficiency.

Referring to the building of new hospitals, the Minister said that next spring he was to lay the foundation stone of the first new hospital to be built since 1939, and this was to be a large mental deficiency colony in the Liverpool region, where there was at the present moment desperate overcrowding and shortage of accommodation. He ended by congratulating the Fountain Group Hospital particularly on the success it had achieved in nurse recruitment and on its research work. "There may be tragically little that can be done for many of the children here, but through research we may in time be able to prevent children suffering from mental deficiency."

Reports of Societies

POLIOMYELITIS IN COPENHAGEN

The Danish experiences during the 1952 epidemic of poliomyelitis were described at a joint meeting of the Epidemiology Section of the Royal Society of Medicine and the Fever Group of the Society of Medical Officers of Health which was held at the Royal Society of Medicine on October 16. Professor A. Bradford Hill was in the chair.

Epidemiology

Professor H. C. A. Lassen explained that Copenhagen was a city with about 1,200,000 inhabitants with one large fever hospital, the Blegdams, which had 500 beds. During the period of the epidemic over 3,000 patients were treated. The experience was peculiar for a European epidemic in that about one-third of the paralysed cases showed respiratory involvement. At the height of the epidemic an average of 10 patients a day were admitted with severe impairment of ventilation, requiring as a rule urgent treatment. There were still to-day over 25 patients remaining from the epidemic who were receiving artificial respiration.

At the beginning of the outbreak it had been intended to carry out a full epidemiological investigation, but the numbers were so great that it became necessary to restrict the study to 300 cases, representing every seventh case in chronological order. A group of 300 controls of similar age, sex, and town district was used for comparison. Many points had been chosen for special examination, but attention was drawn to two interesting findings. In the poliomyelitis group 28.2% had been in contact with another case of poliomyelitis and 33.5% gave a history of contact with minor illness, usually of a respiratory character. In the control group the equivalent figures were 4.1 and 5.7% respectively. Although the possibility of an association with head trauma, vaccination, intramuscular injections, and pregnancy had been examined the differences between the "sick" and the control groups were not significant.

The Cases With Respiratory Paralysis

At the outset of the epidemic the number of tank respirators was insufficient, and even when these were supplemented by loan it soon became clear that the use of the tank respirator in cases with pooling of secretions in the pharynx was fraught with great danger. The assessment of such cases was usually extremely difficult, and it was often impossible to decide which signs were due to virus damage and which were due to secondary changes. After the elaboration of the positive-pressure ventilation method* the results had steadily improved, and in succeeding groups of 50 patients the following percentage fatality rates were obtained: 87, 54, 50, 40, 26, 36, and 22. For the 345 cases the over-all fatality rate was 41%.

Attention was drawn to the prognostic value of certain signs, and the most important of these are shown in the following table:

	Frequency %	Fatality Rate %
Shock	39	67
Ileus	33	43
Hyperpyrexia	19	91
Hypertension	19	42
Azotaemia	22	78
Pulmonary oedema ..	8	93

It was apparent that sex was of some significance, for the fatality rate in men was 49% as against 29% in women.

Dr. J. R. Ibsen described vividly his introduction to the first patient treated, who was a girl of 12 years with paralysis of all four limbs, a developed atelectasis, extremely distressed, cyanosed, and sweating. Despite the immediate problems associated with the introduction of a new method, the establishment of a clear airway with adequate ventilation resulted in almost immediate relief, disappearance of cyanosis, and fall in blood pressure. An *x*-ray picture showed that the atelectasis had re-expanded. Thereafter a "standard" technique was gradually evolved in which a preliminary period of observation with adequate postural drainage was followed, when necessary, by positive-pressure ventilation through a laryngeal tube. The tracheotomy—which was usually through the second and third rings of the trachea—was usually performed under general anaesthesia. The cuffed tube was then inserted through the tracheotomy opening and positive-pressure ventilation initiated. Obviously, although there was what might be termed a standard treatment, it was often necessary to suit the special circumstances of the particular patient. They had, however, favoured an early tracheotomy, for it was found that late emergency operations were often unsuccessful.

In order to concentrate the patients for ease of treatment and post-operative care a special unit was opened to which were admitted all those with evidence of respiratory embarrassment. At each bedside there were all the essentials for suction, and on each corridor all equipment for tracheotomy, etc. On many occasions it became necessary to go out from the hospital to treat emergency cases at home; in this way the specialized help was brought to the patient so that he was made safely transportable before being transported.

In a rough way patients could be divided into two groups, the "wet" and the "dry." The latter, provided ventilation was kept satisfactory, often remained dry and in general did well in the tank type of respirator. The "wet" type could be divided into two broad groups. In the first, ventilation often improved once pharyngeal secretions had been dealt with. Some of these did well on postural drainage alone, but where there was some involvement of respiratory

*See *British Medical Journal*, May 30, 1953, pp. 1208 and 1216.

muscles tracheotomy was generally necessary. The second group showed ventilatory failure even after pharyngeal toilet and postural drainage, and for these tracheotomy with bag ventilation was essential. These cases always did badly in the tank respirator. Not the least advantage of the method was that treatment was available to every patient whether a tank respirator was available or not.

A large number of questions were raised in the subsequent discussion, to which the speakers replied. Dr. THOMAS ANDERSON and Dr. W. RITCHIE RUSSELL moved votes of thanks.

Nova et Vetera

WILLIAM HYDE WOLLASTON

It is just 150 years since the discovery of palladium by a medical man, William Hyde Wollaston. He was born in 1766 and graduated M.B., Cambridge, in 1787. He was elected a Fellow of Caius College and spent two years working in pure sciences. After a period of clinical study in London he went into private practice in Huntingdon and Bury St. Edmunds. In 1794 he was elected a Fellow of the Royal Society, one of his sponsors being his uncle, William Heberden, and in 1797 he published a classification of renal calculi based on chemical analysis. He abandoned medicine for applied science in 1800, his decision being influenced by the fact that the sufferings of his patients caused him extreme mental distress. In 1803 he announced the discovery of palladium, and in the following year he discovered rhodium. He was secretary of the Royal Society from 1804 to 1816, and was elected president in 1820. Wollaston is regarded as the greatest pioneer in the platinum metal industry, since he was the first to bring a trained analytical mind to the problem of obtaining malleable platinum.[1] He died in 1828. In honour of the triple jubilee of Wollaston's discovery, the Institution of Metallurgists organized a Platinum Metals Exhibition in London during the week commencing October 19.

The obverse of the Geological Society's medal which is struck in palladium and awarded annually for outstanding researches concerning the mineral structure of the earth.

[1] *Nature (Lond.)*, 1953, **172**, 700.

Over 300 representatives of Scandinavian and other countries attended ceremonies in Florence on October 24–25 in honour of Niels Stensen, the Danish anatomist. Stensen wrote an important treatise on muscular mechanics, and his *Observationes Anatomicae*, 1662, included the first description of the excretory duct of the parotid ("Steno's duct") and of the ceruminous glands. He travelled widely in Europe, especially in Italy, and much of his work was done in Florence. He became a convert to Roman Catholicism and was nominated as Bishop of Titiopolis. Stensen lived for some years at the court of Tuscany, where he enjoyed the friendship of Duke Cosimo III. He died in 1686, aged 48, and was interred among the Medici tombs in the Basilica of San Lorenzo, Florence. During the recent celebrations his remains were borne in procession through the streets and back to the Basilica, where they were placed in a Roman sarcophagus given by the Italian government.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

The Returned Prisoner of War

SIR,—Your leading article on this problem (*Journal*, October 10, p. 820) merits careful attention.

The emotional background of life in a prisoner-of-war camp, although perhaps more intense, is not essentially different from that of the uncaptured Serviceman in overseas theatres of war. Both in fancy picture the future in rosy colours and both may experience disillusionment and become unsettled on return to civilian life. According to a recent report from the Ministry of Labour and National Service on the resettlement of registered disabled persons[1] the number of ex-Servicemen disabled by psychoneurotic illness is 22,960 out of a national total of 32,484 for this particular condition. Timely recognition by doctors that employment difficulties may precipitate enduring neurotic illness in the emotionally strained demobilization phase could in many instances avert a later catastrophe.

Ample facilities for rehabilitation, vocational assessment, and full industrial training in many trades are provided at the industrial rehabilitation units and training centres of the Ministry of Labour. Early referral to one of these units of any occupationally unsettled ex-Serviceman, whether he has been a prisoner of war or not, is a simple prophylaxis against the most malignant form of disablement.—I am, etc.,

Bromsgrove, Worcs. A. A. WHITE.

REFERENCE

[1] *Report on Resettlement of Disabled Persons During the Year 1952*. 1953. H.M.S.O., London.

Succinylcholine Chloride for Casualty Anaesthesia

SIR,—Have Drs. Terence Vaz and J. M. Bishop (*Journal*, October 17, p. 885) stopped to consider that the light anaesthetic in casualty departments is often administered by doctors inexperienced in the use of relaxants? Although this method can be ideal when carried out by a skilled and experienced anaesthetist, in inexperienced hands it affords frightening possibilities for the conscious yet relaxed patient, whom the anaesthetist thinks is asleep, but who really is pink, paralysed, and perceptive.—I am, etc.,

Cambridge. G. A. HART.

SIR,—Like Drs. Terence Vaz and J. M. Bishop (*Journal*, October 17, p. 885) I was struck with the possibilities of nitrous oxide and oxygen, with succinylcholine chloride as a relaxant, as an anaesthetic technique for out-patient orthopaedic manipulations. After induction with nitrous oxide and oxygen the dose of succinylcholine chloride ("scoline"), in the majority of cases 50 mg., was injected by the surgeon, and after relaxation had been obtained the manipulation was carried out. From the surgical point of view such a technique is excellent, but from the patient's point of view there are distinct disadvantages.

The majority of patients do not like being rendered unconscious by nitrous oxide if they have once been anaesthetized with thiopentone. If the patient is apnoeic as a result of the succinylcholine chloride it is difficult to keep a balance between cyanosis and consciousness, for the conscious patient cannot respond when completely relaxed. Excessive salivation, even after atropine, may cause stridor, and coughing is weaker on recovery, so that it is difficult to clear the respiratory passages. Many patients complain of a temporary loss of voice, and find this most unpleasant.

Although this technique may be satisfactory in the hands of the expert it is not suitable for use in the casualty depart-

ment, where anaesthetics may be given by the inexperienced. My orthopaedic colleagues and I abandoned this technique some eighteen months ago.—I am, etc.,

London, W.1. JOHN GORDON.

SIR,—I agree with the opinion expressed by Drs. Terence Vaz and J. M. Bishop (*Journal*, October 17, p. 885) concerning the use of succinylcholine chloride for manipulations on casualties. This technique provides ideal conditions for the setting of fractures or other manipulations.

However, I have repeatedly noted that, during oesophagoscopy, the cardiac sphincter of the stomach relaxes when succinylcholine chloride is given. The average patient attending hospital as a casualty is quite unprepared for anaesthesia, and may well have a full stomach. For this reason, it seems to me that it is unjustifiable to add the further risk of regurgitation of stomach contents with a wide-open larynx to the already existing risk of vomiting. I have given up the use of succinylcholine chloride for manipulations on out-patients, except when I can be reasonably certain that the patient on whom it is proposed to use this drug has had nothing to eat or drink for at least four hours previously.—I am, etc.,

Luton. D. C. ADAMSON.

Succinylcholine Chloride for External Version

SIR,—You may be interested in the following technique that I have been using for the past 18 months in various obstetrical departments.

Premedication consists of atropine 1/100 gr. (0.65 mg.), given as a rule by subcutaneous injection 45 minutes before the intended procedure. A syringe containing 100 mg. of succinylcholine chloride is introduced into a suitable vein and fixed in position (by strapping, "third hand," or similar device). Anaesthesia of a light plane is obtained by nitrous oxide and oxygen using a Boyle's apparatus. When consciousness is lost, 25 to 50 mg. succinylcholine chloride (according to the size of the patient) is injected, and 15 to 20 seconds later the surgeon may commence his manipulations. Relaxation of abdominal muscles leaves nothing to be desired. There is no marked effect on the uterine tone and usually a successful version is completed by the time the effect of this first dose of succinylcholine has worn off. Should temporary apnoea occur, this can easily be dealt with by rhythmic compression of the rebreathing bag filled with oxygen. Should the relaxation wear off before the completion of the version, further small doses of succinylcholine can be administered from the syringe still *in situ*. The patient wakes up from her N_2O anaesthesia in the usual manner and is fit to proceed home (if an out-patient) within a short time.

We have found this method very useful. It substitutes a light plane of anaesthesia where, before, deep ether or chloroform was found to be necessary. Unpleasant post-anaesthetic sequelae are conspicuous by their absence.—I am, etc.,

Sutton-in-Ashfield. Z. LETT.

Orthopaedic Care in Poliomyelitis

SIR,—Orthopaedic surgeons have never claimed that they were capable of treating "all aspects of the acute stage of the disease (poliomyelitis)," and throughout the many years that they held responsibility for such treatment, long before Dr. Ritchie Russell's recent and sudden enthusiasm (*Journal*, October 24, p. 935), they never failed to collaborate with physicians.

But now that Dr. Ritchie Russell claims this right for himself—fortunately in isolation from most other physicians—and, in so doing, dismisses the prevention of contracture and deformity as "a simple matter which can be dealt with by properly trained nurses" it is time to point out that this dangerous observation shows how little he really knows about it.

He wants to go back 20 years in asking orthopaedic surgeons to "concentrate their efforts on the later stages when the need for their special skill is most apparent." The fact is that orthopaedic surgeons do not want to display their special skill. They want to prevent the need for it long before it is apparent—and they can do so if they share treatment with physicians from the beginning.—I am, etc.,

London, W.C.2. REGINALD WATSON-JONES,
President, British Orthopaedic Association.

SIR,—I have learned a great deal from my friend, Dr. Ritchie Russell, during the last few years, especially about the treatment of bulbar paralysis. I don't much mind his saying (*Journal*, October 24, p. 935) that I belittle the whirring pumps and all that (*Journal*, October 17, p. 884); I know that he knows that I do not really. But I am beginning to think that I have not been very competent in coaching him about the things that orthopaedic surgeons do in the treatment of poliomyelitis, and now I feel very sad about this. I ought to have saved him from making two howlers: (1) that all we think about is the prevention of deformity; he ought to travel round a bit and look at what is being done for the treatment of the paralysis itself—some of the physiotherapy departments and their staffs are rather impressive; and (2) that we fiddle about with splints for patients in respirators and so interfere with the good work being done by our medical colleagues. The answer to this one is simple: We don't.—I am, etc.,

London, W.1. H. J. SEDDON.

Cancer of the Breast

SIR,—In their statistical paper on breast cancer, based on operative results at St. Bartholomew's Hospital, 1930–9 (*Journal*, October 10, p. 787), Messrs. I. G. Williams, R. S. Murley, and M. P. Curwen, with great courage and perseverance, have endeavoured by statistical methods without the aid of lymphatic anatomy or systematic pathological investigation to arrive at the best treatment for breast cancer. I believe they have set themselves an impossible task, and the indecisive character of their conclusions confirms that impression.

The authors dismiss in two lines, without references, my work on lymphatic permeation. They say: "Anatomical investigation has shown no evidence for the centrifugal permeation of lymphatics by cancer cells." It seems evident that they have not happened to see the second edition of my book *Cancer of the Breast*,[1] which contains conclusive evidence on the subject. This edition is exhausted and the French and American editions may be unobtainable, but I shall be pleased, if it is acceptable, to present a copy still in my possession to the library of St. Bartholomew's Hospital.—I am, etc.,

St. Olaves, Norfolk. W. SAMPSON HANDLEY.

REFERENCE

[1] *Cancer of the Breast*, 1922, 2nd ed. London.

Lead in Lollies

SIR,—In your annotation (*Journal*, September 12, p. 613) referring to lead in lollies you mention that a safe limit for domestic water is considered to be 0.3 p.p.m. of lead. In relation to public water supplies it may be pointed out that this figure would be unusually high, even for most soft waters after standing overnight in lead service pipes. In the U.S. Public Health Service *Drinking Water Standards*, 1946, for example, the presence of lead in excess of 0.1 p.p.m. was given as a ground for rejection of a supply.

With regard to your suggestion that "it would seem reasonable to make it illegal to sell lollies containing lead in a higher concentration than that found in the local drinking-water," this would appear to be indefinite and impracticable; a large proportion of drinking-waters, even when drawn from lead service pipes, contain no lead (less than 0.02 p.p.m.) detectable by a reasonably sensitive analytical procedure. The main feature of your annotation is that there should be a sufficiently strict limit, and for this purpose we tentatively suggest 0.2 p.p.m., bearing in mind the cumulative effect of this metal. This is the figure

suggested by the Food Standards Committee for beverages "ready-to-drink" other than beer, cider, or apple juice.[1]

In instances which we have met recently, the lead in lollies has been due to the moulds used in their manufacture being tinned in a tin bath contaminated with a substantial percentage of lead. Lead-free tin can be used for moulds with satisfactory results. Your suggestion of aluminium would be likely to give rise to difficulties owing to this metal being susceptible to corrosion.

The above detailed comments are, however, of less importance than the general conclusion in your annotation that the limit for lead in lollies should be very low. I feel that this needs to be emphasized, because otherwise a much larger amount of lead might be permitted, as for solid foodstuffs. The fact that lead in excess of 0.2 p.p.m. can usually be avoided is proved by its absence from a large proportion of lollies now sold. In some high-grade products with a high content of total solid matter, however, a larger amount may be derived from the traces in the syrup, fruit pulp, citric acid, etc., without any contribution from the moulds, and this must be taken into consideration in fixing a standard for such products.—I am, etc.,

London, S.W.1. ROY C. HOATHER.

REFERENCE

[1] *Analyst*, 1952, 77, 163.

Hop Dermatitis in Herefordshire

SIR,—We were most interested in the letters of Mr. C. L. Shaw (*Journal*, August 29, p. 511), Dr. F. Ray Bettley (p. 512), and Mr. John L. Struthers (*Journal*, September 26, p. 726). In reply to Dr. Bettley, it seems to us that an incidence of dermatitis of 1 in 30 does not necessarily suggest that hop-cones contain a primary irritant. Sensitizing agents vary in activity: with some, such as T.N.T., the incidence of dermatitis may be as high as 50%. Ten normal subjects were patch-tested with hop-cone; all tests after 48 hours were negative. This is in contrast with dermatitis patients, some of whom developed an eczematous reaction at the test site within 12 hours. Ten negative tests in normal subjects can, of course, prove nothing, but suggest that if hop-cones contain a primary irritant it is not a very active one. Tests may be done with dilutions of fresh hop-oil this year. The small quantity available last year was used to establish a difference between fresh and old oil.

We had supposed that hardening was the result of hyposensitization after repeated contact. Schwartz states[1] that if a worker does not learn to protect himself from a primary irritant he will be continually affected by industrial dermatitis. On the other hand, if the skin hazard consists of a sensitizer, and the dermatitis is not sufficiently severe to prevent the patient from working, he will in most instances develop a tolerance or hyposensitivity in from 3–6 weeks. The workers call this hardening. Schwartz also suggests that some workers who develop dermatitis so severe as to prevent them from working may develop tolerance on return to work. This is not supported by patients with severe hop dermatitis. For example, one patient who developed severe dermatitis after 10 days' contact last year succumbed after only half a day in the hop-yard this year.

In reply to Mr. Struthers, the damage to the skin by hop-spines was considered when cases were seen. Superficial scratches insufficient to draw blood are particularly common on the forearms and hands, but did not seem related specially to areas of dermatitis. Scratches are not common on the face, where dermatitis developed first in seven of our patients. One of these had an attack of dermatitis after visiting a hop-yard to deliver meat; he did not touch a single hop on that occasion. He also stated he developed dermatitis round his mouth after ingesting 10 pints of beer. In spite of this, in some cases abrasion may be an additional factor, due both to hop-spines and to efforts to clean hop juices from the skin after the day's work.—We are, etc.,

J. S. COOKSON.
Hereford. ANN LAWTON.

REFERENCE

[1] *Modern Trends in Dermatology*, 1948, edited by R. M. B. MacKenna, p. 255, London

Potassium Permanganate Ulceration

SIR,—We were interested to read the article by Mr. E. A. J. Alment and Dr. C. S. Nicol on potassium permanganate ulceration of the vagina (*Journal*, October 3, p. 759). We feel that the authors should be commended for bringing to wider notice a method of attempted abortion which certainly appears to be on the increase.

One of us has seen three or four cases of such vaginal ulceration in the last few years, and the lesion is not unknown on the North American continent. We agree that there is no doubt about the severity of the haemorrhage which follows insertion of potassium permanganate tablets. The authors quite rightly describe the lesion as being similar to a Hunterian chancre, but it is our experience that the ulcers are usually larger than a typical chancre. This, of course, depends on the size of the tablet and length of time during which it has remained in apposition to a certain area of the vaginal wall. We have found that one of the characteristic features of these ulcers is the very sharp, clear-cut edge between the ulcer and the normal vaginal skin. The intense blackness of the ulcer, too, is almost diagnostic in itself, but this we have found to be only a transitory finding, since—in our experience—the ulcers heal with remarkable rapidity. There is in hospital at the moment a case of permanganate ulceration, and already, after six days, the lesions are well on the way to complete resolution.

Finally, we do agree with the authors that this is a most unsatisfactory way to procure abortion, since in no case in our experience has it been effective.—We are, etc.,

JEFFERY SPRY LEVERTON.
Manchester. IAIN H. KIDD.

SIR,—I note from the article by Drs. E. A. J. Alment and C. S. Nicol (*Journal*, October 3, p. 759) that the first account of potassium permanganate tablets used as an abortifacient was written by Lacassagne and Friess in 1932.[1]

In February, 1931, I was called to a nulliparous married woman who was vomiting seemingly blood-stained fluid. The sight of the "blood-stained" vomitus was sufficient to alarm the woman, her husband, and personal confidants, and she was advised by them to desist from further arbortifacient attempts. "You will only kill yourself," she was told. I discovered that she had obtained potassium permanganate tablets from a local chemist. It has taken me 22 years to discover that the wrong orifice was used by the pregnant woman for the deposition of the tablets. I have no idea how many tablets were swallowed by her, but they certainly had a powerful emetic and deterrent effect.—I am, etc.,

Slough. N. C. HYPHER.

REFERENCE

[1] *Arch. Méd. Pharm. milit.*, 1932, 96, 417.

Exposure Treatment of Burns

SIR,—With reference to your leading article (*Journal*, September 19, p. 665), I think the first, and main, indication in the treatment of burns is not so much the prevention of sepsis as the prevention of pain. The second main indication is the prevention of fluid loss *via* the burnt or scalded surface, and it is only after these two main requirements have been met that one should think of sepsis.

I think egg-white meets all three requirements, and ought to be given a trial in a burns unit. I was once allowed to try egg-white on a child with a burn, and immediately the egg-white was applied the child stopped crying; therefore the pain must have been relieved. And the burn did well. An old lady told me she burnt her hand through upsetting a frying-pan of hot fat. The pain was intense but stopped as soon as egg-white was applied, and "a skin formed over my hand." No bandages, nothing else apparently, and the hand healed perfectly.

I suggest egg-white could be applied by being smeared over the burnt or scalded surface by hands enclosed in sterile rubber gloves. The eggs must be fresh and could be kept in a refrigerator in the casualty department ready for immediate use. As eggs are now fairly plentiful and not too dear, may I suggest this method be given a trial in the Birmingham—or other—burns unit? It seems to me to be worth it.—I am, etc.,

North Shields F. M. E. Davies.

Breast-feeding in Oxford

Sir,—The findings of the above survey by Dr. Alice Stewart and Dr. Celia Westropp (*Journal*, August 8, p. 305) confirm the views I have held with increasing conviction over the years that breast milk, while of value to the baby during the first few weeks of its life, should rightly be regarded as a "running-in" fluid for the new digestive apparatus and not necessarily as the ideal nourishment for any length of time. It is too weak and lacks some of the necessary elements for optimum development. Twenty years ago we urged mothers to keep their babies on the breast and on nothing else except cod-liver oil and orange juice. This we now know to have been bad advice—we were raising flabby, anaemic, rickety children such as, with modern scientific feeding, we rarely now see in this country.

For many women breast-feeding is an exhausting process, and their health picks up rapidly when they stop it. Babies fed at an inadequate breast show irritability amounting to anger—and become contented and eager for their feeds when put on to the bottle. Whenever this happens I ask the mother if her love for her baby has diminished in any way. The answer is a scornful, "No, Doctor." Maternal love is an instinct based upon something deeper either than breast-feeding or, as used to be maintained, painful labour. Nor does the baby give any sign of psychological upset such as the psychiatrists feel it should.

At the age of 1 year I would defy anyone to pick out the breast-fed baby from the bottle-fed one—and the same at 5 years of age. I have taken feeding histories of 400 children aged 5 and have failed to find any one aspect of physical development better in the breast-fed than the bottle-fed. In short, science in this department of life, as in so many others, has improved on nature. I see no reason to regret it.—I am, etc.,

Topsham, Devon. Grace H. Walker.

Tuberculosis Classification

Sir,—Since Dr. Milosh Sekulich suggests (*Journal*, October 24, p. 938) that the review of his book which I contributed to your columns (*Journal*, September 26, p. 715) was unfair and misleading, I may perhaps be permitted a brief reply to his letter.

His book sets out to expound a classification of tuberculosis. A classification should conform to two criteria. It should be logical and self-consistent, its headings so far as possible mutually exclusive, and its basis a corpus of generally agreed and established knowledge; and it should prove convenient and neat when the facts are fitted into it. Of these the first is by far the more important, for any given body of facts can be fitted with more or less convenience into many different classifications, and whether or no any one of these serves its purpose in conducing to clarity of thought will depend principally upon its intrinsic qualities as a logical system. For this reason it seemed to me the duty of the reviewer to concentrate attention upon the logical aspects of the classification.

I have no doubt that Dr. Sekulich can fit any variety of pulmonary tuberculosis into his classification, since he accepts all the theoretical interpretations of observational data which, as I pointed out, are inextricably interwoven with it. But when I attempt the same task I find myself face to face with difficulties and doubts, since I (and, therefore, I imagine, many others) do not accept as established many of the theoretical assumptions which are implicit in the classification, and of which I enumerated a few in the course of my review. Hence I am quite unrepentant in reiterating that simpler and less ambitious systems are less likely to give rise to confusion.—I am, etc.,

London, S.W.3. J. G. Scadding.

The Diploma in Public Health

Sir,—In criticizing the course of instruction for the Diploma in Public Health, Dr. Max Park (*Journal*, October 3, p. 778) has surely missed the point. This diploma is not designed merely to give the necessary technical instruction to a prospective assistant M.O.H. in England. A person with the letters D.P.H. after his name should be an expert in public health in the widest sense of the word. Primarily he should be trained to be an administrator—since public health is largely administration—and able to administer organizations that embrace fields far wider than that within the scope of the average English assistant medical officer of health.

The essentials of this course should include a thorough understanding of at least the following items: the law relating to health—the public, the school, and the factory; the functions of local and central government administration; epidemiology, not only of infectious diseases, but of all sickness, including accidents and occupational diseases; statistical methodology; health educational techniques; all this in addition to the fundamentals of classical public health and sanitary science, the immunology, environmental hygiene, and the like. Far from wishing to reduce his scope, the prospective public health expert should take every opportunity to widen it. Anyone with a real interest in his subject, and who is not interested in the diploma merely as a means of getting himself a job, will be glad to learn all he can about such related subjects as bacteriology, entomology, and parasitology. These are still essential to a real understanding of a large part of preventive medicine. Similarly the course should include a study of nutrition, carcinogenesis, mental health, etc. And one who will have to administer the work of sanitary inspectors, and perhaps factory inspectors, will not begrudge time spent in obtaining at least an understanding, if not a mastery, of these two subjects in addition to his own.

The science of preventive medicine, as developed in England, is honoured and respected throughout the world. It would be a sad day indeed if we followed the suggestion of Dr. Max Park and limited the course of instruction to the small world of the infant welfare centre and the school medical service.—I am, etc.,

Geneva. W. Norman Taylor.

Prevention of Transfusion Accidents

Sir,—Several speakers at the Consulting Pathologists' Group Conference are reported (*Journal*, October 17, p. 878) to have stated that too much blood is ordered by clinicians for surgical and other cases. May not this attitude among the clinicians be a reflection of the advice given by Grant and Reeve in a recent Medical Research Council Special Report,[1] where it is pointed out that clinicians have habitually given too little blood, according to blood volume estimations in many surgical cases? The lessons of this report have been applied very widely, and with benefit, I feel sure. Some simple and rapid method of assessing blood volume in any patient is required. The report rather frowns on haemoglobin estimations as a guide to blood volume, but, with the limitations of the method in mind, a haemoglobin estimation gives useful information.

The greatest enemy of safe blood transfusion is haste: emergencies have to be dealt with adequately, but the technique of preparation must not suffer, and the person actually doing the preparations should be protected from alarmist procedures while at work.—I am, etc.,

Epping. Frank Marsh.

References

[1] Grant, R. T., and Reeve, E. B. (1951). "Observations on the General Effects of Injury in Man, with Special Reference to Wound Shock," *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, No. 277. H.M.S.O.

Obituary

ROBERT TENNENT, M.B., F.R.C.S.Ed.

The death of Mr. Robert Tennent in a nursing-home at Stirling on October 9 at the age of 62 has deeply affected a very wide circle of friends.

Robert Tennent was born at Strathaven, Lanarkshire, on November 13, 1890, and received his early education at Hamilton Academy, of which he was a distinguished pupil. From the University of Glasgow he graduated M.B., Ch.B., with honours, in 1914, a few months before the outbreak of the first world war, in which he served throughout in the Royal Navy. He was granted leave to take the Fellowship of the Royal College of Surgeons of Edinburgh, and this he did in 1917.

After the war he was appointed to the staff of the Royal Hospital for Sick Children, Glasgow, where he was junior to the late Mr. Alexander MacLennan, whom he also assisted in private practice. His appointment to the Victoria Infirmary soon followed, and there, after some years as first assistant to Mr. R. B. Carslaw, he was given charge of wards in 1927 at an unusually early age. Making this work his chief interest and regretfully discontinuing his appointment at the Sick Children's Hospital, he entered into a period of very active hospital and private practice, which terminated by his resignation in 1949, the end of his long and happy association with the Victoria being forced upon him by failing health.

In 1924 he accepted the invitation to become visiting surgeon to Falkirk Infirmary, and his connexion with this hospital was also a very happy one; he shared the responsibility and credit for the planning of the Royal Infirmary, which was opened there in 1932. It was therefore understandable that he should continue to do some work there even after his retirement from practice in Glasgow.

Tennent's work in the Victoria Infirmary earned for him in Glasgow and throughout the West of Scotland a very high reputation, particularly in the fields of abdominal and thyroid surgery; in the latter he achieved especial eminence, and it is to be regretted that he did not live to carry out his intention of publishing his results. Although he latterly tended to be more circumscribed, he was so much the general surgeon that any new method received consideration and underwent trial at his hands. He had been, for example, one of the first in this country to use the Harris technique for prostatectomy. Above all, Tennent was characterized by a dexterity and gentle-handedness which gave him results surpassed by few. He was a surgeon who could make surgery look easy, and his celerity, combined with a natural aptitude for work, made his life an exceptionally full and busy one.

Mr. Tennent taught well and was for many years a clinical lecturer in surgery in the university, and in his later years he examined for the final M.B., Ch.B. Probably the unofficial teaching which he did as an assistant surgeon gave him the greatest pleasure. For many years he gathered round him on Saturday mornings a large number of final-year men, and his ward rounds then were a delight. Many a student learned as much surgery from his informal, anecdotal talks as from a series of more sedate clinics, and these tutorials will live long in the memories of those who attended them. He was regarded as a most kindly final examiner, and it is difficult to imagine any candidate being other than at ease with him.

In spite of all his activities Tennent found time for many interests apart from his profession. Angling was his first love, and he knew intimately most of the rivers of his native country. His friends were legion among countrymen in all walks of life, and his love of country things and country folk was exemplified by his wide knowledge of Scots ballads, which his retentive memory enabled him to recite freely. It was another of his Scots attributes that he could quote the Old Testament at length and with accuracy.

Robert Tennent was a fine surgeon, and he was also a fine man. He was generous to a fault, and his help was always available to patient and colleague alike at no matter what sacrifice of his time and energy. Many young men owe their start in general practice and in surgery to the unselfish help given by him. The second world war made increasing demands on him at a time when normally he might have been expected to begin to enjoy more leisure. These demands were met in full, but only at a cost, and in 1947 came the first signs of the vascular disorder which made it necessary for him to modify his activities. Shortly after this he went to live at Dunblane and gradually made his severance from the city of Glasgow wellnigh complete.

No greater tribute could have been paid to Robert Tennent than the presence of so many friends from so many walks of life at his funeral service in Dunblane Cathedral. He leaves a widow, three daughters, and two grandchildren, of whom he was exceedingly proud. He will be remembered by many with gratitude and affection.—J. P. G. and R. G. H.

I. WALKER HALL, M.D.

Professor I. Walker Hall died at his home at Godalming on October 9 at the age of 85, twenty years after retiring from the chair of pathology in the University of Bristol.

Isaac Walker Hall was born on September 16, 1868, and was educated at Owens College, Manchester, graduating M.B., Ch.B. with honours at the Victoria University of Manchester in 1899 and proceeding to the M.D. three years later. After graduation he continued his studies at Leipzig, Stockholm, and Wiesbaden, and met and worked under the leading bacteriologists and pathologists of those pioneer days. On his return to Manchester in 1900 he was appointed senior demonstrator of physiology, and in the following year he became lecturer in pathology in the university. In 1905 he published, with G. Herxheimer, a book entitled *Methods of Morbid Histology and Clinical Pathology*, which they dedicated to the memory of Carl Weigert. It was a remarkably useful practical handbook.

In 1906 Walker Hall was appointed the first honorary pathologist and bacteriologist to the Bristol Royal Infirmary and the first professor of pathology in the Bristol University College, as it then was. He rapidly gained a reputation throughout the West Country, and within a few years his laboratory at the infirmary was receiving specimens from as far away as Cornwall, there being then no other pathologist in the area. A small department was provided for him in the university buildings in 1910. All the public health bacteriology for Bristol and the adjacent counties and all the clinical

pathology were conducted in these small university laboratories with a staff which, by modern standards, was totally inadequate. Walker Hall's own enthusiasm, energy, and skill made this and much more possible. The first of a series of important papers on the role of carriers in typhoid fever came from his pen in 1908, and he made numerous contributions to the literature on the bacteriology of public health, including work on the pasteurization of milk, the contamination of ice-cream, *Brucella abortus* infection, and bubonic plague.

As a teacher Walker Hall will be remembered for his graphic illustration of immunological procedures. He had a collection of toy animals: a sheep would be "bled" and the "blood" injected into a toy rabbit to illustrate the production of haemolysin for the Wassermann reaction. His students suspected that these toys really belonged to his daughter. He was a delightful lecturer and a stimulating person. When he retired from the chair of pathology in 1933 and was made emeritus professor he became the first director of the university's new department of preventive medicine in laboratories provided by the university in what was previously a student hostel at Canynge Hall. The development of this department was due to his vision and was of immeasurable importance to the university and to the city of Bristol, providing a link between the two authorities which has remained happily without interruption, so that to-day the public health laboratories, the city analyst, and the food inspectors are all housed in the same building with the departments of pathology and bacteriology. He made a place for himself in the history of Bristol and in the history of public health bacteriology in this country.

A member of the British Medical Association for fifty-five years, Walker Hall served as a vice-president of the Section of Pathology when the Association held its Annual Meeting at Belfast in 1909, and at Liverpool in 1912 he was president of the same Section. He was a member of the consulting pathologists group committee of the B.M.A. from 1928 to 1934, and an honorary member of the Association of Clinical Pathologists.

In 1936 he finally retired from Bristol and went to live at Godalming, where his wife, long an invalid, predeceased him. He leaves a daughter.—T. F. H.

J. F. R. GAIRDNER, M.B., M.R.C.S.

Dr. Frank Gairdner, who died at his home at Bungay, Suffolk, on October 8 at the age of 82 after a long and varied life, came of an illustrious Scottish medical family, for his father, Sir William Tennant Gairdner (1824–1907), was professor of medicine in the University of Glasgow from 1862 to 1899 and a Fellow of the Royal Society, and his grandfather, John Gairdner (1790–1876), was President of the Royal College of Surgeons of Edinburgh from 1830 to 1832 and treasurer of the College for many years.

John Francis Robert Gairdner was born at Glasgow on February 6, 1871, and was educated at Uppingham School and Glasgow University, where he graduated M.B., C.M., with honours, in 1894. Although his natural bent was medical rather than surgical, his father's fame, at its height when his son graduated, made it not easy (he conceived) for the young Dr. Gairdner to adopt the career of a physician in Glasgow. He therefore took a series of surgical appointments which ended with his becoming assistant to Mayo Robson at Leeds. Eventual elevation to the full surgical staff at Leeds seemed certain, but the beginning of the South African war in 1899 caused him immediately to join the Expeditionary Force. Extraordinary were the tales he would tell of the medical side of that campaign, for the ravages of enteric fever overwhelmed the Army medical services and led to appalling scenes, much like those described by Florence Nightingale in the Crimean war. When the South African war ended he found he had become much enamoured of that country and decided to stay abroad for a time. He practised first at Germiston, Transvaal, and later at Pretoria, where he became a member of the town council. At the outbreak of the first world war he joined the South African Medical Corps and served against the Germans in South-west Africa. He then joined the R.A.M.C., saw service in France, and later commanded the surgical division of a hospital in Macedonia, with the rank of major.

After the war Dr. Gairdner became surgeon and superintendent to a hospital which had been opened by the owners of a group of collieries in the mining town of Ashington, Northumberland, and there he worked for nineteen years. The work involved a good deal of assessment of compensation in cases of injury, and in this difficult field his patent integrity was of great account. Some years after he went to Ashington he was stricken with severe rheumatoid arthritis and seemed unlikely ever to be able to resume surgery. However, after many months he was able to return to work, albeit with sadly stiffened hands, with which, nevertheless, he was delighted to find himself able to operate as before.

Like many quiet and humble men, his influence upon all classes and kinds of men was great, as the many who served as his house-surgeons at Ashington can testify. "He was one of the most outstanding men whom I have been privileged to meet and to know," wrote one. He had a wonderful old-world courtesy and an endearing conviction of the all-round superiority of the opposite sex.

When the second world war began he had just retired, but was soon working again as medical superintendent of an E.M.S. hospital. In 1941, when he was 70, he learnt that there was a shortage of doctors in the Merchant Service and managed to sign on as a ship surgeon, serving for the next two years at sea, mainly on trans-atlantic runs. He is therefore one of the few men to have gained both the Queen's medal for service in the South African war and the Atlantic Star for service in the last war.

In retirement, Dr. Gairdner was able to cultivate his talents for archaeology, literature, and botany, but the loss of his wife in 1950 dealt him a blow from which he never fully recovered.

FLORENCE R. SABIN, M.D.

Dr. Florence Rena Sabin, the distinguished American anatomist, died at Denver, Colorado, on October 3. She was born on November 9, 1871, in the mining district of Colorado. After obtaining a B.Sc. degree in 1893 she became a schoolteacher in order to earn sufficient money for a medical education. In 1896 she entered Johns Hopkins Medical School and graduated M.D. in 1900. She then joined the research staff in the anatomy department of the school, a post made possible by an endowed fellowship provided for her by the Baltimore Association for the Promotion of University Education of Women. Under F. B. Mall (of whom she wrote an excellent biography in 1934) she embarked on her classical studies on the lymphatics and haemopoietic system. Her important monograph on *The Origin and Development of the Lymphatic System* was

published in 1913. She contributed more than a hundred papers to the literature on the lymphatics, blood vessels, origin of blood cells, bone marrow, and tuberculosis. She was associate professor of anatomy at Johns Hopkins from 1905 to 1917 and was then appointed to the chair of histology. She held this position until 1925, when she left to join the Rockefeller Institute for Medical Research, where she remained until 1938. From 1924 to 1926 she was president of the American Association of Anatomists. Dr. Sabin was the first woman to graduate from Johns Hopkins University, the first woman to teach there, and the first woman member of the Rockefeller Institute and the National Academy of Sciences. The late Simon Flexner once referred to her as "the greatest living woman scientist and one of the foremost scientists of all time."

We record with regret the untimely death of Dr. Anthony Noy Scott on October 14, at the age of 29. He was a most congenial and happy person and will be greatly missed by his many friends. The son of Dr. and Mrs. Steuart Noy Scott, of Plympton, Devon, he went to Clifton College in 1937, and from there to Jesus College, Cambridge. At Cambridge he was, as throughout his whole life, a most popular person. He attained great heights on the hockey field, playing for the university for three years, for one of which he was captain. In 1947 he went on from Cambridge to the London Hospital. He quickly made many friends there and became more than an asset to the hospital hockey team. He also played regularly for Essex county, having previously played for Devon. Soon after coming to "The London" he married Jean Duncan, and the following year their daughter was born. He had many interests besides medicine. He was very skilled with his hands, and ingenious in the uses he put them to: and his knowledge of motor-cars never ceased to amaze. After qualifying in 1952 he decided to take one or two house appointments, but these were cut short by the onset of his fatal illness. This he bore with extreme courage and outward cheerfulness. Our deepest sympathies go to his young widow and their daughter, and to his parents.—D. N. S.

The death occurred on September 25 at Lenox Hill Hospital, New York, of Dr. Max Einhorn, the gastroenterologist. He was aged 91. Max Einhorn was born near Grodno (then in Russia) on January 10, 1862. He qualified M.D. Berlin in 1884. In the following year he emigrated to New York. After a house appointment at the German Hospital he became associated in 1889 with the Post-Graduate Medical School and Hospital, where, seven years later, he was appointed to the chair of internal medicine, becoming professor emeritus in 1922. He contributed several important textbooks to the literature of gastroenterology and originated the concept of achylia gastrica to indicate a primary nervous functional disorder of secretion.

Dr. Thomas McClure, who died recently, was a native of Northern Ireland and was educated at Queen's College, Belfast, and at Edinburgh University, taking the Scottish triple qualification in 1907. He then went to South Wales as chief assistant in an extensive colliery practice in Pontypridd, and afterwards joined his brother, Dr. Samuel McClure, in general practice at Cwmgwrach and Glyn Neath, where he practised for forty years. He retired in 1948. His long association with the district engendered a keen affection for all its inhabitants, and he was proud of the fact that he was not merely regarded as the doctor, but better still as a friend. He evinced a deep interest in the social life and welfare of his patients and proved a generous sponsor of every movement inaugurated for the benefit of the community. In his younger days Dr. McClure was a good angler, a good shot, and an accomplished photographer, but the rapid increase in the local industrial population curtailed his leisure for these pursuits, and his chief hobby then was gardening, on which he became an authority. His gardens were the admiration of all in the district, and in them he found the ideal recreation, for he was always on call, especially for the colliery accidents which were then so frequent in the district (the injured being usually treated at home). For the same reason he developed another hobby, carpentry in native Welsh oak, and in this, as in everything else, he showed considerable skill. Many fine examples of his work are to be found in his home and in the homes of some of his friends. His outstanding characteristic was that whatever he undertook to do he did well. He leaves a widow, who was his helpmate throughout a happy married life.

Medical Notes in Parliament

MENTAL LAW REVISION

Inquiry by Royal Commission

The announcement that there is to be a Royal Commission to inquire into the law and administration relating to the certification and detention of persons suffering from mental illness and mental defect was made by Sir Winston Churchill in the House of Commons on October 22. The names of members of the commission will be announced later. The terms of reference are:

"To inquire as regards England and Wales into the existing law and administrative machinery governing the certification, detention, care (other than hospital care or treatment under the National Health Service Acts, 1946–52), absence on trial or licence, discharge, and supervision of persons who are or are alleged to be suffering from mental illness or mental defect, other than Broadmoor patients; to consider as regards England and Wales the extent to which it is now, or should be made, statutorily possible for such persons to be treated, as voluntary patients, without certification; and to make recommendations."

Sir Winston Churchill said that the Government had had this matter under consideration for some time, and realized that legislation was desirable to bring the law into line with modern thought and development. They considered, however, that there should first be a comprehensive review of the subject by an independent body.

Mr. Aneurin Bevan welcomed the announcement, but commented that the last part of it might give the impression that there were no voluntary patients. The Prime Minister knew that a large proportion of patients treated in mental institutions were voluntary, and it was because the treatment was so satisfactory that it was desired to extend it. Sir Winston Churchill agreed, and said it was intended to extend voluntary treatment as far as possible, subject always to making sure that people were properly protected by certification in cases where treatment involved a considerable measure of restraint.

Mr. A. Woodburn asked whether the terms of reference would include the difficulty of old people who were certified to give them room in mental institutions—people who were suffering from the decay of their mental faculties without necessarily being insane. Sir Winston Churchill said he thought the matter would be considered by the Commission.

There were several questions about the restriction of the inquiry to England and Wales, and the exclusion of Scotland, where the law is different. Sir Winston Churchill said that he was not ruling out a Scottish inquiry, but it would be a pity to mix them together. It seemed to him fairly certain that one would lead to the other—to which he added subsequently that he would like to convey an announcement about Scotland as soon as possible. He also stated that he would bear in mind, when considering the type of person to serve on the Commission, a point made by Mrs. Braddock, that it should include some of the younger school of medical practitioners who were fully qualified in psychiatry.

GIRL'S DETENTION IN MENTAL HOSPITAL

The Home Secretary made a long statement, in reply to questions by four Members on October 22, on the circumstances of the removal by the Home Office from Hollymoor Mental Hospital of a 14-year-old Shropshire girl. Two of the questions asked for an inquiry.

Sir DAVID MAXWELL FYFE stated that the girl, born on July 13, 1939, appeared before the Church Stretton (Shropshire) juvenile court on September 25, 1952, as being in need of care or protection, and was ordered to be sent to an approved school. The order authorized her detention in an approved school until September 24, 1955. The court had information that the girl had been before the court three times for stealing and had been put on probation, that her ability and educational attainment were below average, that seven men had been committed for trial at Assizes in September, 1952, on charges in connexion with her, and that the parents had been warned from time to time by probation officers about the family's association with one of these men, who had been a frequent visitor to their house since 1947 or 1948.

On October 24, 1952, after two outbursts of violent and hysterical behaviour in the remand home where she was awaiting a vacancy in an approved school, she was removed to Hollymoor Mental Hospital on an Urgency Order. Before the expiry of the Urgency Order at the end of seven days, the hospital authorities obtained the father's written consent as required by law to the girl's residence in the hospital as a voluntary patient. On January 14, 1953, the consultant psychiatrist of the regional hospital board wrote to the Home Office reporting that the girl appeared to have found an environment which suited her, but that she showed an impaired reasoning power and a distortion of reality, and that there was a strong schizoid element. He thought she was unfit to be sent to an ordinary approved school or to be sent home, and that she could very well remain at Hollymoor Hospital, where she was receiving no schooling, provided that she was given regular psychiatric treatment as an out-patient in the children's department of another Birmingham hospital. The Home Office accepted this view, and accordingly suggested to the Shropshire County Council that the approved school order should be discharged, the girl remaining a voluntary patient in the hospital. The county council suggested that consideration should be given to the possibility of arranging for the girl to be committed to the care of the hospital authorities as a fit person, and agreed that the approved school order might be discharged.

While the county council's suggestion was under consideration, the acting medical superintendent of the hospital wrote to the Home Office saying that, while he did not regard the girl as a suitable case for indefinite retention in Hollymoor Hospital, he did not consider it advisable for her to be sent straight to an ordinary approved school. In view of this, the suggestion made by the Shropshire County Council was not pursued, but arrangements were made for a senior medical inspector of the Home Office Children's Department to visit the girl at Hollymoor Hospital and discuss her case with the hospital medical authorities. On visiting the hospital on April 8, he learned that medical opinion at the hospital considered the girl to be certifiable as mentally defective. The Home Office therefore invited the Shropshire County Council to present a petition to the judicial authority for the girl's certification. The county council agreed, and the medical superintendent of the hospital expressed his willingness to retain the girl at Hollymoor until a petition could be presented. The Birmingham Regional Hospital Board then endeavoured to find a vacancy in a suitable institution.

On August 29 the Shropshire County Committee of Trades Councils wrote to the Home Office saying that the girl's father had approached them, that the secretary of the committee had visited the girl in hospital on August 24 and was "quite satisfied, in conjunction with other competent hospital authority, that the girl is not insane," and that the Home Office should arrange for the girl's removal from the hospital as a matter of urgency. On September 1 the chairman of the Hollymoor Hospital Management Committee wrote to the Home Office saying that, in his view, the girl was not suitable for either a mental hospital or a mental deficiency institution. The Home Office ascertained from the medical superintendent of the hospital that he still considered that the girl should be certified under the Mental Deficiency Acts. In view of these conflicting opinions, the management committee's requests for early removal, and the difficulty of finding a place for her, the Home Office decided in consultation with the Ministry of Health that the girl should be removed to a classifying approved school for observation and assessment.

Arrangements were made accordingly for the girl to go to the Shaw Classifying School, near Warrington, on September 28. It was learned subsequently that the girl's father had given the hospital authorities the requisite 72 hours' notice to withdraw his daughter, as a voluntary patient, from the hospital, and that he intended to take her home on September 26. Had the girl been taken home by her parents, it would have been necessary to remove her from her home in pursuance of the approved school order. In view of the disturbance which this would have involved for the child, the Home Office arranged for her to go to the Shaw School on September 25.

The Home Office had acted throughout with the girl's best interests in view, and the decision to remove her, in pursuance of the court order, to an approved school (despite the doubts about her suitability for approved school training) was not taken until it became clear that her continued retention in the hospital was not favoured by the hospital management committee. She was not allowed to return home, since the court had decided by the making of an approved school order that, in her own interests, she should be removed from her home environment, and that order was still in operation. There was no foundation for the suggestion that the girl's removal to an approved school in pursuance of an order of the court infringed the rights of the parents, and it was the order itself which restricted the girl's liberty. Both he and the Minister of Health were satisfied that, notwithstanding the unfortunate differences of opinion between the lay members of the hospital management committee and the medical authorities as to the girl's mental condition and as to the proper method of dealing with her, all the parties concerned acted throughout in what they believed to be the girl's best interests. The case illustrated the necessity for an inquiry into the methods of certification of patients suffering from mental troubles on the lines of the royal commission which the Prime Minister had announced.

"Smog" Warnings Proposed

The Minister of Housing and Local Government was asked by Mr. N. N. DODDS and Lieutenant-Colonel M. LIPTON on October 20 what action he was taking to combat fogs similar to those of last December, when many people died as a result of air pollution.

Mr. HAROLD MACMILLAN replied that so far as he knew the only practicable way of combating "smog" was to reduce smoke from chimneys. The problem was not one for which it was easy to devise emergency plans. He was awaiting the report of the Beaver committee. Meanwhile a special effort was needed by all those who burned coal to use it efficiently, and as sparingly as possible during fogs. This applied to householders no less than to industrial and other consumers.

Mr. DODDS said it was remarkable that the Government had no plan ready, in view of the heavy death roll, and, as much was known already about air pollution, would it not be possible to give a warning if similar weather conditions were likely, and to request that domestic open fires and certain industrial processes should be dispensed with during the danger period? Mr. MACMILLAN said that he welcomed this and any other suggestions. He also stated in further replies that the committee on air pollution, presided over

by Sir Hugh Beaver, which was appointed last July, had lost no time and intended to present an interim report shortly—within a few weeks.

Infant Mortality in British Guiana

Mr. O. LYTTELTON, Secretary of State for the Colonies, published a reply on October 21 giving the infant mortality rates in British Guiana for the years 1945–52. These were (per 1,000 live births): 1945, 101; 1946, 87; 1947, 87; 1948, 78; 1949, 77; 1950, 86; 1951, 77; 1952, 82.

In 1946, he stated, the expectation of life was calculated at 49 years for males and 52 for females. Since then there had been a downward trend in death rates, and an approximate calculation for 1952 gave an increase of four years.

Consumption of Milk

Dr. CHARLES HILL, Parliamentary Secretary, Ministry of Food, stated on October 21 that the average weekly consumption of milk per person in the first six months of this year was 4.65 pints. The corresponding figures for 1952 and 1951 were 4.73 and 4.83 pints respectively. The total consumption of full-price liquid milk by the public last August was about 108 million gallons, compared with 110 millions in 1952 and 112 millions in 1951.

Vital Statistics

Poliomyelitis

Poliomyelitis notifications (uncorrected) in the week ending October 17 (41st week of the year) were as follows: paralytic, 81 (107); non-paralytic, 45 (69); total, 126 (176). This is a decrease of 50 compared with the previous week, the figures for which are in parentheses. The seasonal fall seems now to be well under way.

Week Ending October 17

The notifications of infectious diseases in England and Wales during the week included scarlet fever 1,062, whooping-cough 2,096, diphtheria 20, measles 742, dysentery 232, and paratyphoid fever 11.

Infectious Diseases

Only small variations were recorded in the returns of infectious diseases in England and Wales during the week ending October 10. The largest were increases of 103 for whooping-cough, from 2,292 to 2,395, 70 for measles, from 621 to 691, and 55 for dysentery, from 212 to 267.

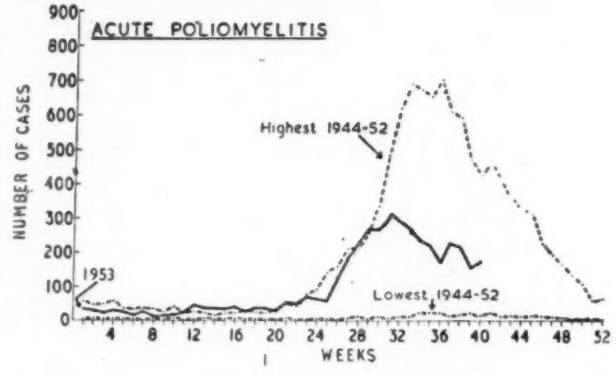
986 cases of scarlet fever were notified, 6 fewer than in the preceding week, and no variations of any size were reported in the local trends. The largest fluctuation in the returns of whooping-cough was a fall of 38 in Warwickshire, from 140 to 102. The largest rise in the number of notifications of measles was 39 in Lancashire, from 128 to 167. 24 cases of diphtheria were notified during the week, and these were 4 fewer than in the preceding week. The largest fluctuation in the local returns of diphtheria was a fall from 7 to 3 in Staffordshire.

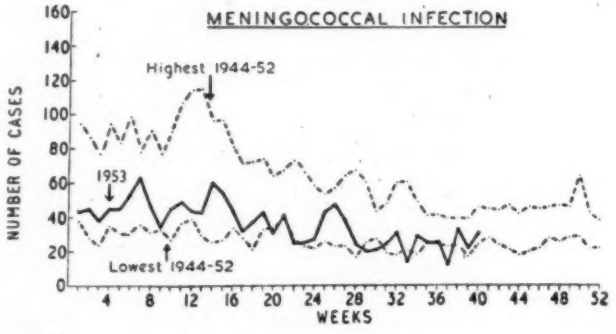
The downward trend of the notifications of acute poliomyelitis was interrupted by a rise of 19 during the week. 176 cases were notified, and these were 28 more for paralytic and 9 fewer for non-paralytic cases than in the preceding week. The chief centres of infection were Lancashire 20 (Blackpool C.B. 5, Liverpool C.B. 4), London 14 (Lewisham 4, Woolwich 3), Somersetshire 14 (Clevedon U.D. 3, Long Ashton R.D. 3), Warwickshire 12 (Birmingham C.B. 4, Coventry C.B. 3), and Dorsetshire 11 (Blandford Forum M.B. 3, Wimborne and Cranborne R.D. 3).

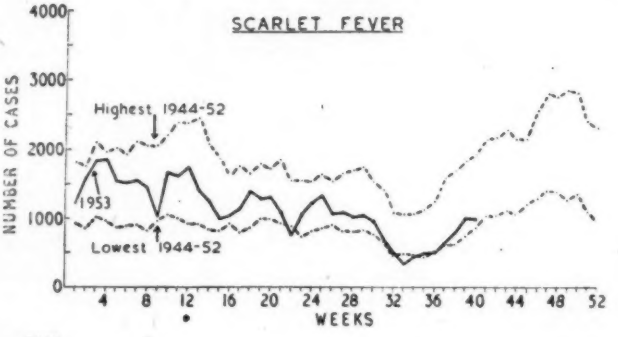
The largest returns of dysentery were London 43 (Lewisham 9), Yorkshire North Riding 38 (Middlesbrough C.B. 38), Northumberland 26 (Gosforth U.D. 24), Lancashire 23 (Liverpool C.B. 10), Yorkshire West Riding 18, Middlesex 16, and Warwickshire 16 (Birmingham C.B. 10).

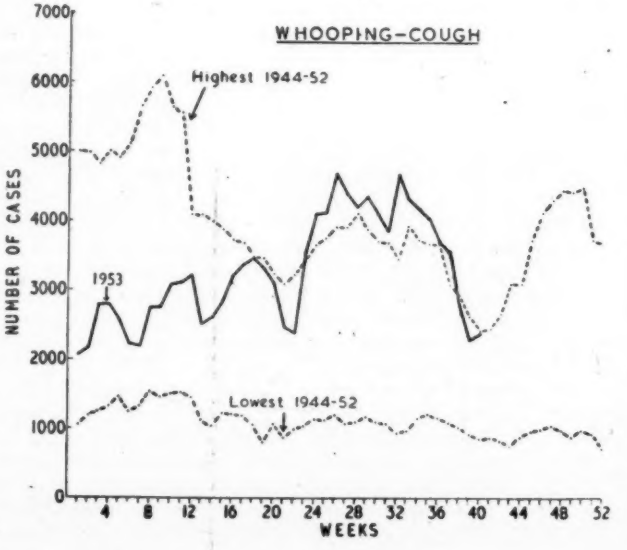
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1944–52 are shown thus - - - - - - -, the figures for 1953 thus ————. Except for the curves showing notifications in 1953, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending October 10 (No. 40) and corresponding week 1952.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1953					1952				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire	Eire
Diphtheria	20	0	3	0		25	1	13	2	1
Dysentery	267	43	136	3	4	192	28	117	1	1
Encephalitis, acute	3	0	0	0		1	0	0	0	
Enteric fever:										
Typhoid	4	1	2	1	2	4	0	3	2	1
Paratyphoid	13	0	0	0	1	23	2	0	0	
Food-poisoning	165	12		0		117	15		23	
Infective enteritis or diarrhoea under 2 years				14	47				15	29
Measles*	691	13	75	15	97	4,696	554	74	32	33
Meningococcal infection	31	1	13	1	1	29	4	9	0	
Ophthalmia neonatorum	42	8	8	0		32	2	13	0	
Pneumonia†	333	28	107	5		371	22	213	6	
Poliomyelitis, acute:										
Paralytic	107	8	25	15	10	101	15	3	9	7
Non-paralytic	69	6				54	7			
Puerperal fever§	249	36	14	2	2	219	33	15	0	1
Scarlet fever	986	58	165	31	45	1,284	118	275	13	58
Tuberculosis:										
Respiratory			123	26				120	33	
Non-respiratory			27	2				17	4	
Whooping-cough	2,395	167	235	28	148	1,126	86	69	17	35

DEATHS in Great Towns	1953					1952				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire	Eire
Diphtheria	0	0			0	0	0		0	0
Dysentery	1	0				0	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0				0	0		0	
Infective enteritis or diarrhoea under 2 years	7	2	1	0	1	9	0	1	0	2
Influenza	6	1		0	1	7	0		0	0
Measles		0			0		0		0	0
Meningococcal infection		0					0			
Pneumonia	115	15		9	0	142	17		4	2
Poliomyelitis, acute	3	0			0	7	2			0
Scarlet fever		0			0		0		0	0
Tuberculosis:										
Respiratory	89	7	9	3	6	92	13	9	3	2
Non-respiratory		2	2	0	0		0	1	0	0
Whooping-cough	2	0		1	0	3	1		0	0
Deaths 0–1 year	224	26	14	7	9	211	22	25	8	20
Deaths (excluding stillbirths)	4,520	656	522	83	134	4,673	660	508	97	136
LIVE BIRTHS	7,813	211	919	213	417	7,816	142	915	232	429
STILLBIRTHS	190	21	21			176	27	25		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

Scientific Exhibition at Glasgow.—The Annual Meeting of the B.M.A. will be held in Glasgow next year, and arrangements are already being made to hold the Scientific Exhibition from July 5 to 9. The exhibitions at Dublin in 1952 and at Cardiff this year proved most popular, and it is intended that the exhibition at Glasgow should cover a wide field of medical practice and research. Any doctor, hospital, or medical school wishing to provide an exhibit should apply for a stand as soon as possible. The last date for receiving applications is December 31, 1953. Those who would like further details or application forms should write to the Secretary, B.M.A. House, Tavistock Square, London, W.C.1.

Synthesis of Oxytocin.—In a letter to the *Journal of the American Chemical Society* (October 5, p. 4879) workers from Cornell University Medical College, New York, claim to have synthesized oxytocin, the principal uterine-contracting and milk-ejecting hormone of the posterior pituitary. If their claims are confirmed this will be the first synthesis of a polypeptide hormone. The synthetic product has been shown to be active in both stimulating labour and inducing milk ejection in women. A dose of 1 γ intravenously caused milk ejection in 20–30 seconds.

Commission on Divine Healing.—The Archbishops of Canterbury and York have appointed a commission composed mostly of clergymen and doctors to consider "the theological, medical, psychological, and pastoral aspects of 'Divine Healing.'" The commission is asked to provide, in two or three years' time, a report "to guide the Church to clearer understanding of the subject; and in particular to help the clergy in the exercise of the ministry of healing and to encourage increasing understanding and co-operation between them and the medical profession." The medical members of the commission are Dr. J. A. Hadfield, Dr. R. A. Henson, Dr. R. Cove-Smith, Professor Alan Moncrieff, Sir James Paterson Ross, Dr. Denis Brinton, and Dr. D. Stafford-Clark. All communications to the Commission should be addressed to the Secretary, Lambeth Palace, London, S.E.1.

Society of Medical Officers of Health.—The presence of the Minister of Education, Miss Florence Horsbrugh, as guest of honour at the annual dinner of the Society of Medical Officers of Health on October 22 emphasized the importance of the school medical service. Referring to the period when she was Parliamentary Secretary of the Ministry of Health in 1939, Miss Horsbrugh said that she was very glad that the Chief Medical Officer of that Ministry was also Chief Medical Officer of the Ministry of Education. She was also pleased to note that that example was being followed throughout the country; less than a dozen authorities now had two medical officers, one for health and one for schools. In the school dental service there were now the equivalent of 928 full-time dentists, the highest number ever in that service. The President of the Society, Dr. C. Metcalfe Brown, also touched on the school medical service. He said that he deplored the tendency to depend upon the consultants of the regional hospital board, and he considered that these consultants should in fact be members of the school health services. The child's health could be achieved only by a team—the parents, teachers, school medical officers, and consultants. Dr. Metcalfe Brown also referred to health visitors. In his experience the infant mortality rate of an area varied inversely with the efficiency of the health visitor service, and he was certain that others had found the same. The health of the guests was proposed by Dr. George Buchan, and Sir George Mowbray and Mr. Arnold Walker made brief replies.

Pneumoconiosis Field Research.—The Coal Board began this month a 10-year field investigation into the prevention of pneumoconiosis among miners. The objects are to discover what level of dustiness is safe for a miner who may spend his whole working life in the pits, and also whether the nature of the dust, such as its silica content, affects the safety level. It is also hoped to gain some idea of the true prevalence and rate of progression of pneumoconiosis in Britain. Twenty-four pits, with widely varying physical characteristics, have been chosen as representative and will be studied by scientists and doctors. Two medical teams, based on Edinburgh and Cardiff, are to carry out radiological surveys of the miners in these pits every two years, and their results will be correlated with the prevailing conditions of dustiness. The scheme is being directed by Dr. J. M. Rogan, C.M.O. of the Coal Board, and the scientific adviser is Dr. A. Cochrane, of the Medical Research Council's Pneumoconiosis Research Unit.

Jenner Medal.—At the recent joint meeting of the Epidemiology Section of the Royal Society of Medicine and the Society of Medical Officers of Health (see p. 991) Sir Francis Walshe, F.R.S., president of the Royal Society of Medicine, presented the Jenner Medal to Mr. A. T. Glenny, F.R.S., for his notable work on diphtheria prophylaxis while a member of the research staff of Messrs. Burroughs Wellcome & Co. Mr. Glenny's experimental work prepared the way for the successful use of alum-precipitated toxoid in man. The Jenner Medal was founded in 1896 by the Epidemiological Society of London, and it has been awarded only 12 times.

Operations on the Frontal Lobes.—The Rockefeller Foundation has made a grant of £7,800 to London University for a three-year study of the psychological effects of frontal lobe operations. The study is being directed by Professor H. J. Eysenck, of the Institute of Psychiatry, who for the last 12 years has been working on the development of objective methods of measuring the personality. Other Rockefeller grants this quarter go to the Universities of Manchester ($45,000 for research on the chemistry of biologically important materials), Cambridge ($25,000 for equipment for the school of biochemistry), and Oxford ($7,500 for equipment for work directed by Sir Howard Florey, F.R.S.).

Leverhulme Research Fellowships, 1954.—Application is invited for Fellowships and grants in aid of research. These awards are intended for senior workers prevented by routine duties from carrying out research. They are limited to British-born subjects normally resident in the United Kingdom, but in exceptional circumstances the condition as to residence may be waived. Applications from groups of workers engaged upon co-operative programmes of research (particularly if long-term) will also be considered. The duration of the awards will not normally extend over more than two years or less than three months, and the amount will depend on the nature of the research and the circumstances of the applicant. Forms of application may be obtained from the Secretary, Miss M. Branney, Leverhulme Research Fellowships, 3–5, Salisbury Square, London, E.C.4. The last date for applications is December 31, 1953. Awards will be announced in May and will date from September 1, 1954.

New Warning System for E.B.S.—The London Emergency Bed Service has modified its warning system to hospitals so as to make it a more sensitive index of the difficulty of obtaining beds. In calculating the rate (percentage of applicants admitted) no account will be taken in future of cases admitted through the medical referee. It is expected that this will result in the warnings being both issued earlier and cancelled later than in the past. A white warning will be sent out when the admission rate as now calculated falls to 85%, a yellow warning when it reaches 80%, and a red at 75%. In addition, at the request of the Ministry of Health, the white warning may be given even earlier still if there is reason to suppose that a serious epidemic is developing.

A Doctors' Orchestra.—Dr. H. Ucko's appeal for music-loving members of the medical and dental professions in London to join him in forming an orchestra (*Journal*, September 26, p. 727) has been successful, and the orchestra had its first rehearsal last week. At present it consists of 53 players—21 violins, 3 violas, 10 celli, 1 double bass, 2 flutes, 4 oboes, 6 clarinets, 1 bassoon, 2 horns, 1 trumpet, 1 trombone, and one player of tympani. More players are wanted in every category. Rehearsals will be held weekly on Thursdays, and anyone interested should communicate with Dr. Ucko at 14, Upper Wimpole Street, London, W.1.

Royal College of Physicians of Ireland.—On October 19 Dr. Edward T. Freeman was elected President of the College and Dr. J. A. Wallace Vice-President.

Dangerous Drugs.—On November 1 N-allylnormorphine will come within the provisions of Part III of the Dangerous Drugs Act, 1951.

Drawing Conventions for Laboratory Apparatus.—The British Standards Institution has circulated a draft British Standard for Drawing Conventions for Laboratory Apparatus. The last date for the receipt of comments (which should be sent to the British Standards Institution, 2, Park Street, London, W.1) is December 1.

Family Doctor.—The November issue of *Family Doctor* is now available. It contains articles on the interpretation of dreams (Dr. T. Traherne), pneumoconiosis, chiropody as a career, alcoholism (Dr. G. K. Selborne), and the infectious diseases of childhood (Dr. T. Anderson). Topical subjects discussed are the prevention of draughts and feeding the family in winter (Dr. A. Porter).

COMING EVENTS

College of General Practitioners.—The first annual general meeting of the College of General Practitioners will be held on Saturday, November 14, at 2 p.m., in the Great Hall, B.M.A. House, Tavistock Square, London, W.C.1. Foundation Membership and Associateship will close on that day. The agenda for this meeting and the first annual report of the College were dispatched to all members and associates on October 23. Will anyone who has not received them please communicate with the secretary?

Contraceptive Technique.—A lecture and demonstration will be given by Dr. Marie Stopes, Ph.D., at the Mothers' Clinic, 108, Whitfield Street, London, W.1, on November 5, at 2.30 p.m. Admission free, but tickets must be obtained in advance.

Smoke and "Smog."—An exhibition on smoke and "smog" will be open from November 9 to December 5 from 10 a.m. to 5 p.m. on Mondays to Fridays, and from 10 a.m. to 12 noon on Saturdays, at the Museum of Hygiene of the Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W.1. Admission free.

The British Association of Sport and Medicine.—A meeting will be held at 5 p.m. on November 11 in the Meyerstein Theatre of the Westminster Hospital Medical School, Horseferry Road, London, S.W.1. Dr. H. N. Bleasdale will speak on "The Health and Minor Maladies of Swimmers and Divers," and Dr. Michael Ward on "Some Medical Aspects of the Everest Expedition, 1953."

Empire Rheumatism Council.—The guest speakers at the symposium on "butazolidin" on November 13 (see *Journal*, August 15, 1953, p. 403) will be Dr. Otto Steinbrocker, of New York, and Professor Domenjos, of the University of Saarbrücken.

The London Medical Exhibition will be held in the new hall of the Royal Horticultural Society, Greycoat Street, London, S.W.1, from November 16 to 20. It will be open daily from 11 a.m. to 6.30 p.m. Lord Horder will perform the opening ceremony at 11.30 a.m. on November 16.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Applications should be made first to the institution concerned.

Friday, October 30

INSTITUTE OF LARYNGOLOGY AND OTOLOGY.—3.30 p.m., clinical meeting for general practitioners. Mr. C. Gill-Carey: The Common Cold.

Monday, November 2

INSTITUTE OF PSYCHIATRY.—5.30 p.m., Dr. E. Stengel: lecture-demonstration.

●POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. William Evans: The Electrocardiogram in Cardiac Pain.

ROYAL EYE HOSPITAL.—5.30 p.m., Miss J. M. Dollar: Management of Diseases of the Uveal Tract.

Tuesday, November 3

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor E. C. Amoroso: Biology of the Foetal Membranes and the Placenta.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Viral Diseases of the Skin.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Arris and Gale Lecture by Mr. H. A. Haxton: Sympathetic Supply of the Upper Limb.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Theatre, 5 p.m., Dr. M. H. E. Hulbert and Dr. W. M. Levitt: *X*-ray Therapy in Gynaecology.

WEST END HOSPITAL FOR NERVOUS DISEASES.—5.30 p.m., Dr. C. C. Edwards: neurological demonstration.

Wednesday, November 4

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Viral Diseases of the Skin.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. A. R. C. Higham: Enuresis.

MANCHESTER MEDICAL SOCIETY: SECTION OF MEDICINE.—At Medical School, Manchester University, 4.30 p.m., address by Dr. Denis Williams.

MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m., Dr. J. C. Gilson: Is Coal Dust Harmful to Man?

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—7.30 p.m., Mr. T. C. Denston, B.Pharm., Ph.C., F.R.I.C.: General Survey of the *British Pharmacopoeia. 1953*.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. F. V. Flynn: Na and K Metabolism.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Lord Amulree: Geriatrics.

SOCIETY OF APOTHECARIES OF LONDON.—4 p.m., Mr. J. B. Harman: Management of Inoperable Malignant Disease; 5.15 p.m., Dr. F. P. Lee Lander: Asthma and its Treatment.

Thursday, November 5

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. P. M. F. Bishop: Physiological Action of Sex Hormones.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., Dr. D. K. Adams: Food in Relation to Health and Disease.

●INSTITUTE OF CHILD HEALTH AND INSTITUTE OF NEUROLOGY.—At National Hospital, Queen Square, W.C., 5.30 p.m., Dr. E. A. Carmichael: Hemiplegia: Clinical Types, Diagnosis and Treatment.

●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 3.30 p.m., Professor A. M. Claye: The Forceps in Present-day Practice.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Symposium to be opened by Mr. A. Sutcliffe Kerr: Management of Paraplegia.

LONDON UNIVERSITY.—At Royal Society of Medicine, 5 p.m., Semon Lecture by Professor F. C. Ormerod: The Management of Cancer of the Larynx.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—At Royal Society of Medicine, 2.15 p.m., 28th Maudsley Lecture by Earl Jowitt: Medicine and the Law.

ROYAL SOCIETY.—4.30 p.m., The Leeuwenhoek Lecture by Dr. K. M. Smith, D.Sc., F.R.S.: Some Aspects of the Behaviour of Certain Viruses in their Hosts and of their Development in the Cell.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Dundee, 5 p.m., Professor J. Glaister: Some Medico-Legal Trifles.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. Denis Williams: neurology demonstration.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—4.30 p.m., demonstration of clinical cases; 5.15 p.m., discussion of clinical cases.

Friday, November 6

INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. B. F. Russell: Pyogenic Infections.

●POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor W. Melville Arnott: Peripheral Vascular Disease.

ROYAL EYE HOSPITAL.—4.30 p.m., Mr. A. J. Cameron: Recent Advances in Retinal Detachment Surgery.

Saturday, November 7

INSTITUTE OF LARYNGOLOGY AND OTOLOGY.—11.30 a.m., Professor E. Luscher (Basle): Psychical Factors in Ear, Nose, and Throat Diseases.

●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 12 noon, Mr. J. A. Stallworthy: Genital Tuberculosis.

MIDLAND TUBERCULOSIS SOCIETY.—3 p.m., Professor J. McMichael: Pulmonary Heart Disease.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Barter.—On October 23, 1953, at Queen Charlotte's Hospital, London, W., to Marjorie (formerly Staveley), wife of Dr. Antony P. Barter, a daughter—Suzanne.

Fisher.—On October 22, 1953, at the Royal Maternity Hospital, Belfast, to Sheila, wife of Oliver D. Fisher, M.D., M.R.C.P., a daughter—Amanda Jane.

Solomons.—On October 2, 1953, in Dublin, to Joan (formerly Maitland), wife of Michael Solomons, M.R.C.O.G., a son.

Stok.—On October 13, 1953, at Liverpool Maternity Hospital, to Pauline (formerly Jones), wife of Dr. E. Theodoor Stok, a son.

Swan.—On September 12, 1953, at the Civil Hospital, Aden, South-West Arabia, to Veronica (formerly Donnelly), wife of Thurloe Swan, M.Ch., F.R.C.S.I., a daughter—Oonagh Mary.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Exchange Resins for Peptic Ulcer

Q.—*What is the consensus on the status of anion exchange resins in the medical management of peptic ulcer? Which resin or type of resin is believed to be best, and in what dosage? Are there any toxic possibilities or contraindications?*

A.—Anion exchange resins are large insoluble bases with the capacity to absorb the anion of an acid forming an insoluble resin salt; and in the alkaline small intestine the anion exchange is reversed. Amberlite 1 R–4 (particle size 200 mesh), a polyethylene polyamine substituted resin of diphenylol dimethyl methane and formaldehyde in basic form, has been used for the treatment of peptic ulcer, and up to 28 g. by mouth daily has been used without causing untoward effects.[1] The neutralizing efficiency is not impressive, comparable effects being obtained by 0.6 g. aluminium hydroxide and 3.2 g. of Amberlite 1 R–4, and there is evidence that it is in no way superior to other antacids. No definite ill effects have been noted, and constipation does not develop during its administration. Spears and Pfeiffer[2] found that all but one of a group of 30 patients experienced relief from pain, but this, however, was not synonymous with healing, and in some cases recurrence or complications occurred during treatment. Wirts, Sullivan, and Hammerly[3] found that the effect of resin for duodenal ulcer was comparable to that of aluminium hydroxide gel, but did not notably surpass it. Similarly, Segal *et al.*[4] achieved 65% clinical remission with chronic recurrent duodenal ulcer, but failed to get assistance in the more serious and protracted cases. On the whole, there seems remarkably little justification for its use in peptic ulcer.

REFERENCES

1 Kirsner, J. B., Palmer, W. L., Levin, E., and Klotz, A. P. (1951). *Ann. int. Med.*, **35**, 785.
2 Spears, M. M., and Pfeiffer, M. C. J. (1947). *Gastroenterology*, **8**, 191.
3 Wirts, C. W., Sullivan, B. H., and Hammerly, W. C. (1950). *Ibid.*, **15**, 1.
4 Segal, H. L., Friedmann, H. A., Ellis, E. E., and Watson, J. S. (1950). *Amer. J. dig. Dis.*, **17**, 293.

Liquid Paraffin and Cancer of Bowel

Q.—*What is the origin of the view that the continued use of liquid paraffin may cause cancer of the bowel? It crops up from time to time and is invariably denied in the medical journals.*

A.—The belief that the long-continued use of liquid paraffin by the mouth as an aperient conduces to cancer of the intestine has no doubt been encouraged by, if it did not arise from, the most unfortunate term "paraffin cancer" applied to occupational cancers of the skin occurring in workers exposed to shale oil, petroleum, or products derived from them. "Aniline cancer" is another most misleading title.

The word "paraffin" has at least two meanings: in chemistry it is a quite exact term denoting a class of compound of the general formula C_nH_{2n+2}; while in everyday life and in commerce it may be applied to a variety of mineral oils, especially to those used for heating and lighting, which may consist to a large but not to a specific extent of paraffins conforming to the chemical definition.

One may perhaps take some data, which are still relevant, from a paper published many years ago "On the Cancer-producing Factor in Tar" by E. L. Kennaway.[1] In the lignite tar and shale oil industries the workmen who have most to do with the most concentrated forms of chemical

paraffins are the least liable to affections of the skin. High-temperature coal tar, which, together with its pitch, produces far more cases of industrial cancer than do all other materials put together, is especially poor in paraffins, and contains less of them than does non-carcinogenic blast-furnace tar. The petroleums of Pennsylvania, Canada, Galicia, and Rumania contain especially large amounts (up to 85%) of chemical paraffins, but are not distinguished by producing many cases of petroleum cancer. Prosser White[2] says, "The writer has watched women and girls employed all their working hours, year after year, bedaubed with refined paraffin wax free from impurities, none of whom have ever experienced the least trace of inconvenience or distress."

So far as the writer knows, there is no evidence that the medicinal "liquid paraffin" taken by mouth has any carcinogenic action upon the alimentary tract or upon any other organs. The proverbial difficulty of proving a negative of course presents itself here. Anyone interested in this question could tabulate the deaths from cancer of various parts of the intestine given in the annual *Statistical Reviews* of the Registrar-General, and the standardized death rate given from time to time in these publications, beginning at the time when the ingestion of liquid paraffin became common. Possibly this date was somewhere about 1910, when "intestinal stasis" was very generally discussed and was alleged to be the cause of at least one common form of cancer. But no doubt the records of pharmaceutical firms would give the information required. If we have no data showing a direct carcinogenic action of paraffins upon the alimentary tract, we have no more, so far as I know, indicating any indirect action of this kind due to interference with the absorption of fat-soluble substances.

The name "paraffin" does not occur among the immense number of compounds named in Hartwell's *Survey of Compounds which have been Tested for Carcinogenic Activity*.[3]

References

1 *British Medical Journal*, 1924, **1**, 564.
2 White, R. P., *The Dermatergoses or Occupational Affections of the Skin*, 2nd ed., London, 1920, p. 143.
3 Hartwell, J. L., *Survey of Compounds which have been Tested for Carcinogenic Activity*, 2nd ed., Bethesda, Federal Security Agency, 1951.

Prevention of Amoebic Dysentery

Q.—*Is the chemoprophylaxis of amoebic dysentery a practicable procedure? If so, what drugs are recommended, and are there any dangers?*

A.—The chemoprophylaxis of amoebic dysentery is not a practicable procedure. If normal hygienic precautions in relation to food and drink are adopted, the risk of contracting amoebic dysentery is remote, and it is by such measures that infection should be avoided. Even if they had an effective prophylactic action, which is doubtful, amoebicidal drugs are not suitable for indefinitely repeated administration.

Antiseptics for Surgical Theatres

Q.—*What antiseptics are recommended for (a) the storage of previously sterilized sharp instruments so that they can be used at a moment's notice; (b) the washing of basins, trolleys, and operating theatre floors? Do antiseptics have any advantages over soap or detergent and water for the latter purposes?*

A.—(*a*) Liquor boracis et formaldehydi (borax 1.5 g., solution of formaldehyde 2.5 ml., phenol 0.4 g., water to 100 ml.) is effective. It is completely bactericidal (sporicidal effect included) and non-rusting. Instruments placed in it require rinsing in sterile water before use, and irritating vapour from it may be a drawback. Spirit, commonly used for this purpose, is at least theoretically unsatisfactory because it is not completely bactericidal; it may even contain living bacterial spores.

(*b*) Operating theatre furniture and floors which have been contaminated with septic material should be swabbed with a strong phenolic disinfectant such as 5% phenol or 2% lysol; this should be given 15 minutes to act before being washed off. Unless any such specific contamination has occurred the use of disinfectants has no advantage over washing with soap and water. The practice of adding small quantities of odoriferous disinfectants to water used for washing is wasteful and useless; the amount required to produce an antiseptic smell is only a small fraction of that which would be necessary actually to disinfect.

Milk for Tuberculous Patients

Q.—*I should be pleased to know the modern opinion regarding the value of milk for tuberculous cases. Is it given because it is an easily assimilable type of food, because of its relevantly high calcium content, or is it a medical fashion which has continued without any really sound therapeutic basis?*

A.—The value of milk for tuberculous patients lies in the fact that it is a well-balanced food which is easily assimilated. It is of most value to the really ill patient, who may be able to take it more easily than an equivalent amount of solid food. During the rationing period, when protein foods suffered the greatest reductions, the allowance of two pints (1.1 litres) of milk daily to tuberculous patients was a wise provision, and until meat rationing is abolished patients with active pulmonary tuberculosis should be encouraged to take this amount of milk. On the other hand, if milk forms too large a part of the diet it is expensive and often indigestible, so that patients should be made aware that it possesses no specific virtues as a food in pulmonary tuberculosis.

Indrawn Nipples in Children

Q.—*One of my daughters aged 9—healthy in every way—is showing signs of developing indrawn nipples. Is there any way of preventing this as she grows older?*

A.—It is probably impossible to assess the situation accurately at such a young age, and post-pubertal development of the breasts may well alter the picture. In any case, nothing useful can be done now, and any attempt at treatment might well have unfortunate psychological effects on the girl; the condition should not even be brought to her notice. The question of treatment should be deferred until she is adult, and, in the writer's view, until she is pregnant.

NOTES AND COMMENTS

Corrections.—In the article by Mr. Patrick Clarkson and Mr. D. A. Campbell Reid entitled "Use of the Electrodermatome, with Special Reference to its Value in Serious Burns" (October 3, p. 763) the name Padgett in the first paragraph was wrongly spelt Paget. There was also a misprint in the description of the instrument The current required to operate the instrument is 110 volts, not 10 volts as stated.

Mr. N. J. Ainsworth asks us to correct a statement in his appreciation of the late Mr. J. H. Badcock (*Journal*, October 24, p. 943). Mr. Badcock was not "the last remaining member of that group of great dental surgeons and teachers . . ." but only one of the last of the remaining members of that group, of which happily there are some still alive and well.

Sir Ewen Maclean was mistakenly said in our last issue (p. 941) to have provided the only instance of a Chairman of the Representative Body becoming President. Sir Henry Souttar held both these offices, and he has the distinction of also being an ex-Chairman of Council.

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